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The Commonwealth of Massachusetts

SUGGESTIONS
TO SCHOOL ADMINISTRATORS
FOR HEALTH TEACHING
IN JUNIOR HIGH SCHOOLS

MASSACHUSETTS COURSE OF STUDY IN
HEALTH EDUCATION

BULLETIN NO. 1

April 1940



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FOREWORD

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A mimeographed report was issued for purposes of trial in certain interested school systems. About three years ago, it was definitely decided that the immediate task was to establish these outlines for the use of grades seven, eight, and nine, and to defer the preparation of outlines for the upper grades to a later date.

A second report was mimeographed and used for experimental purposes in certain schools in 1936-37.

The following bulletin is one of five which has been prepared by the committee. The State Department of Education is pleased to cooperate with the State Department of Public Health in the issuance of these bulletins. I wish to thank all concerned, and particularly the committee whose names are herein listed, who have made the work possible.

WALTER F. DOWNEY,

Commissioner of Education.

The Massachusetts Department of Public Health, realizing that the school health education program is an integral part of preventive medicine and the public health program, is especially pleased to cooperate with the State Department of Education in the publication of a guide for the teaching of health in the junior high school. It is the duty of the public health profession to inform the educational profession as to the thoughts and actions which they wish the citizens of the community to have regarding their health. The cooperation of the public health profession with the teaching profession is indeed a powerful alliance and one which is going to make it possible to bring closer to realization our goal, a people free of preventable illness and defects.

PAUL J. JAKMAUH, M.D.

Commissioner of Public Health.

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INTRODUCTION

The Program of Committee Activity

The Committee on Health Education in the Secondary Schools was appointed by the State Department of Education to suggest a program of direct health instruction. Such a proposed program for Junior High Schools is now being issued in the form of four other separate bulletins. This Committee set up the general plan. Individual members prepared teaching units on the respective topics. These units were revised upon the basis of suggestions from other members of the Committee. The revised units were mimeographed and placed in the hands of a limited number of junior high school teachers whose suggestions and criticisms were considered in making the later revision.

For the purpose of still more effectively adapting the material to the age levels for which it was prepared, subcommittees of junior high school teachers and administrators examined and further revised various units which were then turned over to a small editing committee.

The work of this Committee represents a voluntary time contribution on the part of Committee members who were already carrying a full schedule of professional work. This fact and the experimental use of the present units explains why the units themselves have not all been put into similar form.

Names of Committees

This bulletin was prepared by the following Committee on Health Education in the Secondary Schools appointed by the State Department of Education:

Dr. Clair E. Turner, Professor of Biology and Public Health, Massachusetts Institute of Technology, *Chairman*

Jean V. Latimer, Coordinator of Health Education, Division of Child Hygiene, State Department of Public Health, *Executive Secretary*

Mabel C. Bragg, Associate Professor of Education, Boston University

James A. Chalmers, Principal of High School, Fitchburg

Dr. M. Luise Diez, Director, Division of Child Hygiene, State Department of Public Health

Daniel J. Kelly, Supervisor of Physical Education, State Department of Education

Anna A. Kloss, Supervisor of Teacher Training in Household Arts, State Department of Education

Ida M. Lewis, R.N., Instructor in Health Education, School Department, Brookline

A. Russell Mack, Supervisor of Secondary Education, State Department of Education

Helen G. Mank, Head of Science Department, High School, Lawrence

William T. Miller, Principal of Washington Irving School, Roslindale

Walter G. Whitman, Head of Science Department, State Teachers College, Salem

In addition, the following subcommittees assisted in the preparation of other bulletins dealing with health teaching in junior high schools:

Subcommittee on Community Health

Ruth Parsons Fuller, formerly at Beebe Junior High School, Malden

Rae E. Kaufer, Lynn Tuberculosis Association, Lynn

Jane C. McCabe, Driscoll School, Brookline

Mary G. O'Doherty, Washington Irving School, Roslindale

Elna I. Perkins, Massachusetts Tuberculosis League, Boston.

Subcommittee on Physiology as Applied to Daily Living

Maria Bates, Beebe Junior High School, Malden

Mary M. Beverly, R.N., Junior High Schools, Malden

Henry B. Burkland, Principal, Bates Junior High School, Middleboro

William H. Cuzner, Junior High School, Lexington

Dr. Florence B. Hopkins, Consultant in Dental Hygiene, Division of Child Hygiene, State Department of Public Health

Rae E. Kaufer, Lynn Tuberculosis Association, Lynn

Mary G. O'Doherty, Washington Irving School, Roslindale

Elna I. Perkins, Massachusetts Tuberculosis League, Boston

Richard J. Schmoyer, Director of Health and Physical Education, Lynn Public Schools, Lynn

Mary Spalding, Consultant in Nutrition, Division of Child Hygiene, State Department of Public Health

Katherine Wilder, Weeks Junior High School, Newton.

Subcommittee on Home Nursing and Child Care

Dr. M. Luise Diez, Director, Division of Child Hygiene, State Department of Public Health

Jean V. Latimer, Coordinator of Health Education, Division of Child Hygiene, State Department of Public Health

Mary M. Beverly, R.N., Junior High Schools, Malden.

Subcommittee on First Aid

Ann W. Dinegan, R.N., Consultant in Public Health Nursing Education, State Department of Public Health

SUGGESTIONS TO SCHOOL ADMINISTRATORS FOR HEALTH TEACHING IN JUNIOR HIGH SCHOOLS

Outline of the Plan of Organized Classroom Health Instruction

The units of instruction which are published in separate bulletins are planned to follow in general the program of health instruction in the elementary schools as outlined in an earlier report of a separate State Committee. The program of study proposed by this Committee for the junior high schools suggests the following subject matter arrangement:

Community Health	Grade VII
Physiology as Applied to Daily Living . . .	Grade VIII and first half of Grade IX
Home Nursing and Child Care for Girls . .	The last half of the school year for Grade IX
First Aid for Boys	The last half of Grade IX

The plan assumes instruction at least two periods a week throughout each school year. It is recognized that schools differing in their organization may give some of these units a different grade placement, but the Committee recommends the proposed plan for general adoption.

The separate bulletins are as follows:

“Suggested Teaching Units in Community Health”

“Suggested Teaching Units in Physiology as Applied to Daily Living”

“Suggested Teaching Units in Home Nursing and Child Care”

“Suggested Teaching Units in First Aid”

This bulletin considers some of the opportunities for health education and some of the problems of organization.

Other Opportunities for Health Education in Junior High Schools

It is universally agreed that the promotion of good health in the individual and the community is one of the major objectives of all education. The health education of a child at school develops through various types of experiences. One group of experiences is provided by direct health instruction. While the elementary school provides a program of health education, it is only at the secondary school level that the pupil is ready to receive an appreciable amount of health knowledge. It is clearly a function of the Junior and Senior High School to continue the habit training program as needed, and in addition, to provide a considerable body of the health information which forms a background for intelligent living.

The bulletins developed by this Committee are concerned primarily with direct health instruction but school administrators must recognize the educational significance of all of the other phases of the school health program. It is most important that all of these phases should be properly organized with respect to their educational influence as well as with respect to their technical efficiency. Experiences arising out of the pupils' contact with environmental sanitation, health services of the school, physical activity programs, and those phases of the general educational program which bear upon the hygiene of daily living all are important.

The following outline of school health activities suggests the many factors which are involved in school health education in its broadest sense.

I. Health Protection

A. Sanitation of the School Plant

1. Location (orientation, noise, dust, odors, traffic dangers, playgrounds, drainage)
2. Buildings (construction and equipment for fire protection, water supply, toilets and lavatories, health-service room, teachers' rest room, classroom construction, lighting, heating, ventilating, seating, upkeep of the building)

B. Examinations

1. Physical Examinations (completeness, thoroughness, technique, frequency)
2. Dental Examinations
3. Psychological Examinations

C. Communicable Disease Control

1. Routine Procedure (inspections, exclusions, readmissions, educational measures, immunization)
2. Procedure in Epidemics (recognition of epidemic, treatment of contacts, measures to prevent infection)

II. Correction of Defects and Health Conservation of Defectives

A. Special Classes (open-air classes or program for debilitated children, sight-conservation classes, mentally retarded classes, classes for the crippled, speech-improvement classes, lip-reading classes)

B. Clinics (nutrition; dental; eye, ear, nose, and throat; cardiac; lung; posture; habit)

C. Follow-up Service (methods of securing correction, adequacy of nursing service, records)

III. Health Promotion

A. Hygienic Arrangement and Administration of the School Program (These activities lie in the field of general school administration.)

1. For Pupils:

Satisfactory provision for school lunches, and proper arrangement of the school program, including attention to such items as the length of the recitation period and periods of unbroken study, recesses, the sequence of subjects, the amount of homework, the number of pupils per room, alternation of different types of work, the nature and conduct of examinations, discipline and punishment, extracurricular activities, the selection of proper textbooks and source material, and the maintenance of proper teacher-pupil attitudes.

2. For the Teacher:

Opportunity for relaxation, satisfactory opportunity for obtaining lunch, limitation of extracurricular requirements, provision for undisturbed workplace after school, sick leave

B. Physical Activities:

1. Playgrounds (space, supervision, equipment, activities)
2. Gymnasium or Playroom (location, space, lighting and ventilation, temperature, floor material, showers)
3. Physical-Training Program (objectives, personnel, basis of prescribing activity, type of work given, correlation with health program, tests)

C. Health Instruction and Motivation

The success of the school in achieving the good-health objective depends upon the proper integration of all three phases of the general health program. Many of these conditions and activities are beyond the control of the individual teacher or even of the school principal, but the success of many of them is dependent upon the interest and cooperation of the teacher and principal.

The heating, ventilation and cleaning of the school building are matters which depend partly on its construction and equipment. Their upkeep is dependent upon the work of the school custodian but they are also proper objects for the supervisory attention of both teachers and principals.

Medical, nursing and clinical services support and supplement the work of the teacher. Through them the child receives important educational experiences. Accident prevention and the avoidance of fatigue depend on the proper organization and administration of school and classroom programs.

Within the school system, classes for speech improvement, lip reading, sight conservation, and faulty posture are meeting the needs of many handicapped pupils. The provision of all these health safeguards and activities depends on the cooperation of all authorities concerned with the organization, administration and supervision of the school system, as well as on the interest and attention of various nonschool public health agencies.

For a comprehensive discussion of the entire field of the school health program, the teacher is referred to the *SCHOOL HYGIENE HANDBOOK*, published by the Massachusetts Department of Public Health, Division of Child Hygiene, under the direction of Dr. M. Luise Diez, head of that division. This handbook is now in revision.

Graphic illustration of the way in which the various phases of the Health Education program parallel one another under different executive heads, are found in the following chart from the *SCHOOL HYGIENE HANDBOOK* of the Division of Child Hygiene, State Department of Public Health. For copies of this chart, apply to Library, State Department of Public Health.

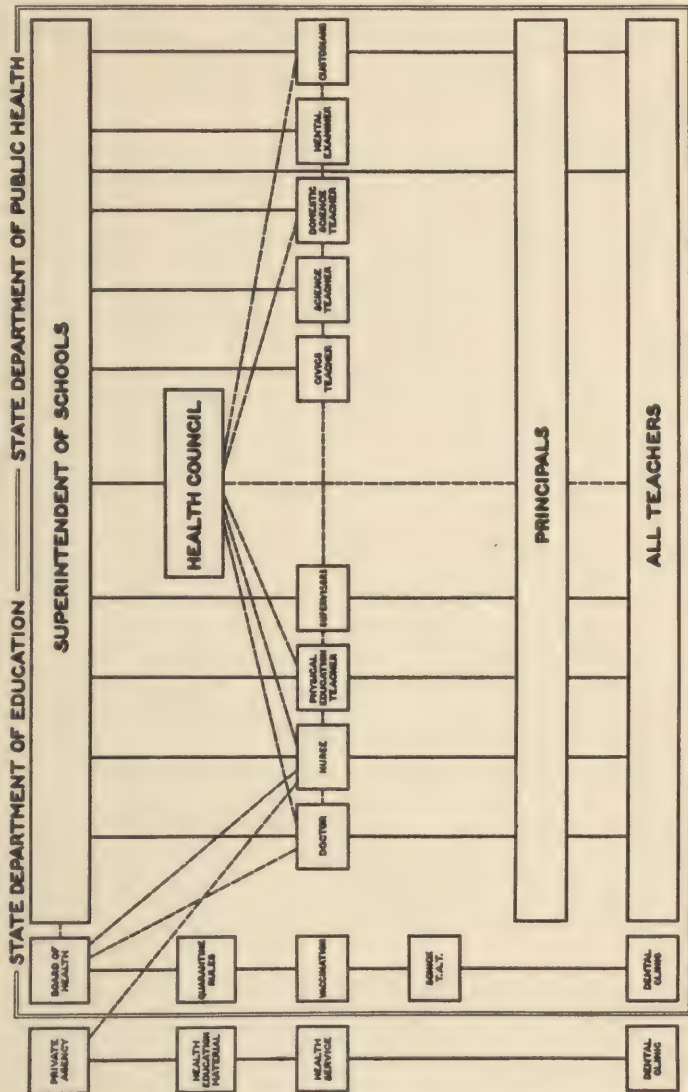
There is of course a close relationship between Health Education and Physical Education and in some school systems the two are administered together. One of the major objectives of Physical Education is the improvement of health. However, Physical Education has other very worth-while objectives; and for that reason it is not given any detailed attention in this outline. The corrective phase of the general health programs especially demands correlation and integration with the Physical Education work.

Various extracurricular activities have a definite health implication. Such projects as Safety Campaigns, First Aid Clubs, Clean-up Clubs, Home Nursing Groups, and Intramural Athletics are closely allied to the protection and promotion of health.

Authorities now generally agree that specific classroom instruction in definite health subject-matter areas is essential at the junior high school level. Nevertheless we should also consider the correlation between health teaching and the other subjects of the curriculum. Wherever there is a health aspect in the content or method of any subject, there we find the opportunity for correlation or integration. The peculiar value of this term "integration" is that it expresses very tersely the desirability of a unified body of knowledge. When correlated material in different subjects is so connected in teaching that a proper sense of relationship results in the youthful mind, we have the beginning, at least, of the integrated curriculum.

Many subjects in the junior high school curriculum involve units of instruction bearing upon the subject of health. In any school the hygiene teacher, and in fact all teachers who touch on health, should know what health subject matter is being taught in every other course. It is good psychology to emphasize any point by repetition in different settings; and the approach to fundamental health facts from different angles is definitely helpful. However, there is growing evidence that a health instruction program made up *entirely* of integrated teaching is inadequate.

CONTRIBUTORS TO A SCHOOL HEALTH PROGRAM TOWN SYSTEM



The content of different subjects of instruction varies rather widely in different schools, but it may be useful here to mention a few units of instruction in certain subjects that offer important health contributions. Taking the major subjects first, we may mention:

English.—Books of biography dealing with great physicians, medical discoverers, or other types of health heroes. Oral and written compositions dealing with health subjects. Spelling of the simpler medical and health words in common use.

Mathematics.—Problems based on health topics, including graphs of vital statistics, percentages of fatal diseases, determination of heating and ventilating efficiency.

Geography.—The influence of climate on health and human efficiency, the value of sanitation, the sources of various common medicines and the contrasting standards of living of different peoples.

History.—The importance of health precautions in war and peace, with mention of such names as Reed and Gorgas. In Ancient History an emphasis on the progress we have made over the methods and knowledge of ancient times, and mention of some of the founders of the crude science of medicine from which our present development has sprung.

Science.—Air and its relation to health; safe water and its health values; chemical reactions in food digestion; the effect of weather upon health; sunlight; important elements of the human body; the nature of light in vision; sound and hearing; kinds of plants and their relation to the well-being of man; animals as a source of food and as a source of disease; and selected problems in sanitation. Indeed, the entire health program is scientific in its bearing.

Civics.—Civics considers the adjustment of the individual to the community; the interdependence of people; the effect of changing economic conditions upon health; transportation in relation to health; social health agencies; occupations and health; housing; community planning; health responsibilities of government; taxation for health purposes; standards of living in relation to health; and the importance of health in the history of national development. The development of sound personality and the health aspects of occupations are very personal matters which lead directly to a consideration of health values.

Foreign Languages.—These offer a chance to utilize health terms in vocabulary and conversation drills, as well as in reading.

Manual Arts.—These contribute to health training by emphasizing the need of clean hands and materials, proper clothing, correct posture, good ventilation, safety precautions, and habits of industry. They also give an opportunity to make things which have a health application, like the fly trap and the window ventilator. Manual arts also contribute to mental hygiene.

Home Economics.—Laundering; food preservation; making meals attractive; the selection of food; menu planning, individual menus; cleanliness in the kitchen; the sanitary condition of stores and markets; the care of clothing; the relation of clothing to the weather; the selection and use of different types of clothing, shoes, stockings, footwear, underwear; the care of the scalp and the hair, the use of cosmetics; the care of the home. In some school systems home nursing and child care are taught in connection with the work of the Home Economics Department.

Physical Education.—At all times there should be a consciousness developed that the physical factors taught are for the ultimate purpose of better personal health and increased social efficiency. The importance of sleep, rest, bathing, proper clothing and footwear, and adequate protection from the weather all have distinct health implications. Such personal experiences as increased pulse frequency, breathlessness, stitch in the side,

perspiration, muscle cramps, etc. may serve as motivating starting points for laboratory work in physiology.

Art.—Here there is abundant opportunity to make posters and to construct health exhibits. Many classic works of art offer splendid examples of posture and symmetry.

Many schools have been successful in handling the extracurricular part of the health program through a student and teacher organization. Pupils in a single room may form a health council, or a whole building may have a health council composed of two or three delegates from the room. In this case each room has an organization, but only the delegates attend the council meetings. The delegates are the leaders of the health activities in their group. The council will choose a health counsellor, generally a teacher, who will be the active leader of the council.

The organization and functions of a Faculty-Student Health Council in a high school are found in the **SCHOOL HYGIENE HANDBOOK**, Massachusetts Department of Public Health. This handbook is a valuable source of information concerning all phases of school hygiene.

The Student Health Council will suggest health activities for the school along the following lines:

School sanitation, school luncheon, school grounds, classroom temperature and ventilation, classroom lighting, safety conditions in building and on grounds, health education publicity to include bulletin boards, assembly periods and students' activities to interest pupils in the correction of physical defects.

Schools interested in the operation of the Faculty-Student Health Council should secure from the Massachusetts Department of Public Health copies of the mimeographed outlines for "Survey of Health Conditions in High Schools," and the outline describing the "Faculty-Student Health Councils."

Integration of Health Education with The Junior High School Homeroom Organization

In the junior high schools of today the pupils are not with one teacher all the time. They live in an environment full of activities with many individuals under the supervision of many teachers. In order that one person may be responsible for pupils in their educational experiences in school life, schools have set up an organization built around the homeroom.

The homeroom then becomes the school home of a pupil, and the homeroom teacher, the school parent. To understand the pupil as a whole in all phases of his school life becomes the work of a homeroom teacher. In classrooms, shops, on athletic fields, in clubs, assemblies, and in the lunchroom and corridors of the building, the homeroom teacher must feel the responsibility for a pupil's actions as a mother does for her child.

In this work health and health attitudes play a very important part. Most schools have assistance from boards of health, from school doctors and nurses, physical education teachers, hospital and dental clinics and a health record card which gives homeroom teachers valuable information. Morning inspection in the homeroom is important before starting classes. These checkups are an indication of how well health habits function.

But what about building up right attitudes toward healthy living in school, at home, and in the community? A homeroom teacher needs especially to emphasize:

- Personal cleanliness
- Posture and poise
- Nutrition and selection of good school lunches
- Mental and emotional control
- Protection against disease (children's diseases and colds)
- Care of the teeth

All these are important and require not only the work of the science or health teacher and the physical education teacher, but also the daily practice and follow-up which a homeroom teacher can do through classroom programs, conferences, and pupil committee work. The homeroom program may be organized for the following:

- Weighing and measuring
- Self-checking of health habits
- Securing dental attention for all pupils
- Securing correction for all physical defects.

Many pupils need special guidance and a detailed study needs to be made of their cases. Every study should begin with health factors. By adjustments of physical defects or improvement in health habits many a pupil has succeeded where before he failed. Poor eyesight, defective hearing, lack of proper nourishment, unhealthful home conditions are often the cause of pupil difficulties in school.

Every teacher, then, is a health teacher and should be ready to study the individual health needs of every pupil in the homeroom.

Health Teaching in Relation to Organized Unit Instruction

In connection with the actual classroom teaching of health, teachers are urged to consider carefully the value of the Unit Method of instruction. In the matter of textbooks there is at present a wide choice. It is desirable to examine textbooks carefully before adopting them for use in carrying out this course of study, so that we may be sure that the textbooks contain sufficient material for use in the topics here outlined. Teachers are likewise urged to experiment widely in the use of objective tests in their Health Education work. The individual teacher is best qualified to construct such tests in connection with her own classroom work. We refer here to tests of the results of teaching, not to physiological or psychological tests of the actual bodily or mental health of individual pupils. If any unit of instruction results in a body of acquired knowledge which is worth while, then surely such a unit should be followed by some form of test designed to discover the efficiency of the teaching. The three common types of objective tests; viz., the completion, selection and yes-no type can certainly be utilized more extensively in the field of Health Education.

Teaching Personnel for Health Instruction

Finally it is the belief of this Committee that conscientious cooperation of all the teachers who may use this outline will result in a great improvement in the teaching of health. There has been an unfortunate tendency to assign Health Education in very small units to a large number of teachers in each school. There is no reason why this subject should not become a highly developed specialty, with teachers very definitely trained to carry it out. While it is true that there is a very close connection among General Science, Biology, Chemistry, Physics and Health Education, it is not desirable to consider Health Education as simply a minor subtopic of these other sciences.

This fact is being recognized today by the establishment of specialized Health Education departments in various colleges and universities, and by the provision of certificate examinations in this field in city school systems. The teachers who are doing Health Education work at present are showing a very high degree of energy and effort. We may be confident that further development of the subject will be greatly enhanced by the increased attention given to it by teachers, specially trained and devoting their entire teaching program to Health.

Like every well-equipped educator, the man or woman who is to teach health in Junior High School needs to possess an understanding of child psychology and of educational method based upon sound courses of instruction. It is not

to be expected that a teacher would undertake work in this field without at least eight semester hours' credit in psychology and education. In addition he should possess certain subject-matter tools which will enable him to teach in the field of health. The first group of these tools should consist of a thorough groundwork in the fundamentals of the basic sciences—physics, chemistry, (including organic chemistry) and biology. Preparation should also include training in anatomy, physiology and bacteriology, and the basic principles of personal and public health, including hygiene (personal, mental, and social), municipal sanitation, vital statistics, communicable disease control, nutrition, health education, first aid, public health organization and school health administration. These last named fields of knowledge he will use not only in teaching, but also in guiding and coordinating the school health program.

It is recognized, of course, that at present health teaching is and must be assigned in many schools to teachers who do not have all of the above qualifications. These qualifications represent the ideal toward which school administration should move. This type of professional education could not be secured in less than a four-year college course leading to the bachelor's degree. In most cases at least a year of postgraduate work would be required. In no field of endeavor is it more important that the teacher continually supplement his basic training with the most recent facts concerning current scientific research and discovery.

Educators are increasingly recognizing the desirability of employing a special Director or Supervisor of Health Education with thoroughly adequate training in both health and education who will furnish leadership in school health education at both the elementary and secondary school levels.

The Commonwealth of Massachusetts

SUGGESTED TEACHING UNITS
IN
COMMUNITY HEALTH
FOR THE
JUNIOR HIGH SCHOOL

MASSACHUSETTS COURSE OF STUDY IN
HEALTH EDUCATION

BULLETIN NO. 2

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Introductory Note to Teachers

The Committee on Health Education in the Secondary Schools was appointed by the Department of Education. This committee set up the general plan. Individual members prepared teaching units on the respective topics. These units were revised upon the basis of suggestions from other members of the committee. The revised units were mimeographed and placed in the hands of a limited number of junior high school teachers whose suggestions and criticisms were considered in making the later revision.

For the purpose of still more effectively adapting the material to the age levels for which it was prepared, subcommittees of junior high school teachers and administrators examined and further revised various units which were then turned over to a small editing committee.

The work of the committees represents a voluntary time contribution on the part of committee members who were already carrying a full schedule of professional work. This fact and the experimental use of the present units explains why the units themselves have not all been put into similar form. The teacher is referred to the separate bulletin on "Suggestions to Administrators for Health Teaching in Junior High Schools," for a consideration of the general plan.

The units are planned to follow an adequate program of health instruction in the elementary schools. This program of study proposes the teaching of "Community Health" in Grade VII; "Physiology as Applied to Daily Living" in Grade VIII; also "Physiology as Applied to Daily Living" for the first half of the school year for Grade IX. It proposes the teaching of "Home Nursing and Child Care for Girls" and "First Aid for Boys" in the last half of the ninth year. Both teacher and pupil references are included in connection with the units to be taught.

This is a tentative outline. For a later revision of these units, your suggestions are desired concerning grade placement, interest, other possible experiments, activities, demonstrations, references, and visual material.

The units are planned on the assumption that two periods a week throughout the school year are available for health instruction. If your time allotment does not allow you to complete all the units, it is recommended that you teach adequately the most important ones and omit the others.

This outline presupposes the program of health education prescribed for the first six grades in the Course of Study in Health Education for the Elementary Grades, published in 1931 by the State Department of Education. If your pupils have had this training, they will be ready for community health as a next step following their study of cleanliness for the individual and cleanliness in the home. If their training in the first six grades has been inadequate, you will need to take that fact into consideration.

Teachers who are well trained in municipal and general sanitation have found this a fascinating and delightful subject for seventh grade pupils. We realize that some teachers have a less adequate background in this field than others and that the fair trial of this material means more work for them than for better equipped teachers. After each unit will be found valuable references for the teacher who wishes to gain increased background.

You will be presenting new subject matter. In addition, it is hoped that you will contribute to the broad program of health education which includes healthful school living and school health services. You will find many opportunities to consider personal health problems in connection with the study of community health.

This program of study seeks to show the pupils the importance of community health activities and the place which these activities play in maintaining the health of the people. The approach, coupled with a study of the situation in your own locality, will develop real interest. A study of unrelated technical details of sanitation, of course, will not develop interest.

Alcohol, narcotics and safety are treated in separate outlines issued by the State Department of Education. A separate unit of work on Tuberculosis is available from the Massachusetts Tuberculosis League, 1148 Little Building, Boston. A unit of work on the Nature of Bacteria is available from the Metropolitan Life Insurance Company, 1 Madison Avenue, New York City.

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XVI	The Health of the Worker	4 or 5	34
XVII	Community Aspect of Safety	4 or 5	36

UNIT I

YOUR SCHOOL AND YOU

*Time: One or two lessons***I. Objectives:**

1. To arrange one's own daily schedule so that it will allow time for all personal health habits.
2. To learn the activities of the pupils' own school health program.
3. To appreciate the importance of cooperating with the school health program.

II. Suggested Teaching Plan:

1. Discuss the difference between the junior high school (or intermediate school) and the elementary school which the pupils previously attended.

2. What changes in pupils' daily schedule do these differences make necessary? (Time of rising to reach school on time; lunch may be chosen at school or brought from home; home study may require careful planning of afternoon or evening time outside of school; all health habits, including recreation, need specific time allotment.)

3. What does your school do for the health of pupils? (Items included here will depend upon the health program of the individual school. The teacher may be guided by the suggested teaching outline for Unit XIV, "School Health", which may be taught as the next unit if so desired.)

4. What can pupils do for the health of pupils? (Emphasize such items as: helping to keep the school building and its surroundings clean; preventing the spread of contagious disease; safety practices and hazards present at your school; activities which may be carried on during the year to find out more about health. The teacher will adapt the discussion to include problems existing in her particular school. She may stimulate interest in the year's program by starting one of the activities listed below.)

III. Suggested Activities:

1. Each student may plan a "time budget" similar to a money budget, for his notebook. He will plan time for all the important health practices, as well as for other duties. He will check up on his performance of the health habits, in order to be sure his "budget" is practical.

2. A special column in the school newspaper may be devoted to health items.

3. A health bulletin may occupy one slate of the blackboard in the health classroom. Here may be posted timely bits of health advice, news about the school health program, or personal health reminders.

4. From time to time, a personal health score card may be filled in by each pupil. By checking his health habits for the previous 24 hours, the pupil will be reminded of any items which he has forgotten. If he does this several times during the school year, he will be able to note improvement.

5. Each pupil may decide upon one or two of his health practices which are unsatisfactory and with the teacher's help make a plan for their improvement.

6. A safety patrol may be organized for the purpose of carrying on activities for the prevention of accidents; for example, directing traffic in corridors before school and between classes; supervising the use of drinking fountains at recess.

7. The class may undertake a survey of the school health program. This may include a study of all the school activities and procedures related to health, or a survey of certain selected important activities. The school health program may include such items as: sanitation, medical and nursing service, handwashing facilities, communicable disease control, correction of defects, and health teaching in the classroom.

Pupil References:

ANDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit I. Ginn & Company, 1939.

BROWNELL, IRELAND & TOWNE: *Science in Living*, Unit VII. Rand McNally & Company, 1935.

CHARTERS, SMILEY & STRANG: *The Body's Needs*, pp. 378-394. Macmillan Company, 1935.

GREGG & ROWELL: *Home and Community*, Chap. I. World Book Company, 1936.

TURNER & COLLINS: *Community Health*, Chap. I. D. C. Heath & Company, 1935.

WINSLOW & HAHN: *The New Healthy Living*, Chap. XXIV. Charles E. Merrill Company, 1935.

WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chap. I. Thomas Nelson & Sons, N. Y. 1936.

Teacher References:

Books marked * deal with principles and methods of health education and will not be mentioned in subsequent lists or references. The references at the ends of units will be limited primarily to books having factual material bearing on the topics under consideration.

*CHENOWETH AND SELKIRK: *School Health Problems*. F. S. Crofts & Company, 1937.

*CONRAD AND MEISTER: *Teaching Procedures in Health Education*. W. B. Saunders Company, 1938.

*GROUT: *Handbook of Health Education*. Doubleday, Doran & Company, 1936.

- **Health Education*, Report of the Joint Committee of the National Education Assoc., and the American Medical Assoc., 1930.
- *HUSSEY: *Teaching for Health*, New York University Bookstore, 1938.
- MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH: *School Hygiene Handbook*.
- PRESCOTT & HORWOOD: *Sedgwick's Sanitary Science and Public Health*, Chap. XXVI. Macmillan Company, 1935.
- *RYAN: *Mental Health Through Education*. Commonwealth Fund, 1938.
- SMILEY & GOULD: *Community Hygiene*, Chap. XVIII. Macmillan Company, 1935.
- *TURNER: *Principles of Health Education*. D. C. Heath & Co., 1938.
- *WHITE HOUSE CONFERENCE REPORT: *The School Health Program*. Appleton-Century Company, 1932.
- *WILLIAMS & SHAW: *Methods and Materials in Health Education*. Thos. Nelson & Sons, 1935.

UNIT II

KEEPING THE FAMILY WELL

Time: One or two lessons

I. Objectives:

1. To learn what health problems confront the family and how these problems may be solved by the family living in the country.
2. To learn some important ways in which the early settlers safeguarded the health of the family when establishing a new home.

II. Suggested Teaching Plan:

1. Discuss the general ways in which the life of the pioneer settlers differed from our life today, and list on the board the items related to health. (Many students may tell of things learned from family histories or moving pictures.)
2. When a pioneer family made a journey to establish a new home, how did they provide water, food and shelter along the way?
3. What considerations for health entered into the selection of a site and the building of a new home? (Water supply, drainage, fertile soil, waste disposal, sunshine.)
4. What were the chief foods of the family and how were they secured? (Domestic animals [pork, chicken, beef, milk], wild animals [venison, bear, fish], vegetables [corn, beets, greens, carrots, turnips], grains [corn, wheat, rye], fruits [crab apples, berries].)
5. Discuss the ways in which the wastes from the home could be disposed of without endangering the health of the family. (This discussion should include the problems of getting rid of waste paper and garbage, placing an outdoor toilet, and disposing of ashes, rubbish, and manure from the farm animals.)
6. How do conditions of pioneer life compare with life today as regards danger from contagious diseases? Why? (Personal contact uncommon; control of water supply, waste disposal; food dependent on each family individually.)
7. What are the safety practices important in the home? In case of accident, how did the pioneer family meet such an emergency? (Discuss the value of having every boy and girl know some of the principles of first aid.)

8. Compare the health problems of the pioneer with health problems of camping or remote farm life of the present time. (Seek the experience of the group. Consider the pioneer's health practices and those of present day rural or camp life. Boy Scouts, Girl Scouts, and Camp Fire Girls may make contributions from their knowledge of the essentials of camp sanitation.)

III. Suggested Activities and Questions:

1. Students may construct models or sketches of a pioneer home or a present day camp in remote location.

2. A group of students may pretend they are members of a pioneer family and dramatize the selection of a building site and the planning for the building of a home. (The same type of dramatization may be made with reference to setting up camp for the night during a camping trip.)

3. Students may select for compositions in English such topics as the following: "Keeping the Pioneer Family", "Safeguarding Health on a Camping Trip", "Some Health Problems of the Pioneer Family".

Pupil References:

ADDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit I and Unit IX. Ginn & Co., 1939.

BIGELOW & BROADHURST: *Health in Home and Neighborhood*, Chap. VII. Silver, Burdett Co., 1930.

GREGG & ROWELL: *Home and Community*, Chap. I. World Book Co., 1936.

TURNER & COLLINS: *Community Health*, Chap. II, Revised edition. D. C. Heath & Co., 1935.

WINSLOW & HAHN: *The New Healthy Living*, Chap. XXII. Charles E. Merrill Co., 1935.

WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chap. II. Thomas Nelson & Sons, N. Y. 1936.

Teacher References:

SMILEY & GOULD: *Community Hygiene*, Chap. I. Macmillan Co. 1935.

TURNER: *Personal and Community Hygiene*, C. V. Mosby Co., St. Louis, 1939.

UNIT III

THE HEALTH OF MY TOWN OR CITY

Time: 1 to 3 lessons

I. Objectives:

1. To learn the health problems of the pupil's own community.

2. To learn how the grouping of families makes it necessary to handle some health problems under trained persons as part of our governmental system.

3. To know and appreciate that community health activities exist for the purpose of safeguarding the health of the people in the community and that they are paid for with money secured through taxes.

4. To recognize that the people who live in a community must do their part as individuals in carrying out the common activities which safeguard their own health and that of others in the community.

II. Suggested Teaching Plan:

1. Why was it unnecessary for Robinson Crusoe or the Swiss Family Robinson to have a government?

2. Why do groups of people living near each other find it desirable to set up some form of government? (Roads, schools, playgrounds, waste disposal, fire and police protection.)

3. Would it be a good idea for each family living in a city to have its own well and waste disposal system? (Lack of room; creation of nuisance; more work than having a community supply.)

4. Discuss some of the health services of your town or city government, and their usefulness to you. (Street cleaning, providing clean water, collecting rubbish and garbage, providing parks and playgrounds, communicable disease control, regulation of food supply.)

5. How are community health activities paid for? (Taxes.)

6. Make as full a list as you can of the health problems in your community that call for governmental control, and discuss them briefly. (The important problems will be dealt with in detail in later units.)

7. What is your personal responsibility in these health problems that are controlled for you through specially trained persons in your government? (Lead students to realize that community health activities are for their benefit, that such health work is paid for with the taxes of the people, and that each individual has a share in responsibility for the support of community health measures. The protection of the water supply, the maintenance of isolation in contagious diseases, and the promotion of public safety are examples of health problems in which individual co-operation is essential.)

III. Suggested Activities and Questions:

1. Find out how much money was spent in your town or city last year for health. How much was spent per person?

2. For what activities was the money spent? (See reports of your Health Department.)

3. Students may record in notebooks a list of community health problems.

4. Four-minute speeches may be given (or written papers submitted) on such subjects as the following: "A Comparison Between Health Problems in the City and in the Country", "Community Health Work in Our City", "Our Personal Responsibility in Community Health Problems".

Pupil References:

ADDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit I, Unit II, and Unit IX. Ginn & Co., 1939.

BIGELOW & BROADHURST: *Health in Home and Neighborhood*, Chap. VIII. Silver, Burdett Co., 1930.

BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit 8. Rand, McNally & Co., 1935.

GREGG & ROWELL: *Home and Community*, Part II, Chap. I. World Book Co., 1936.

TURNER & COLLINS: *Community Health*, Chap. II. D. C. Heath & Co., 1935.

WINSLOW & HAHN: *The New Healthy Living*, Chaps. XXII & XXVIII. Charles E. Merrill Co., 1934.

WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chap. VI. Thomas Nelson & Sons, N. Y. 1936.

Teacher References:

PRESCOTT & HORWOOD: *Sedgwick's Sanitary Science and Public Health*, Chap. XXVIII. Macmillan Co., 1935.

TURNER: *Personal and Community Hygiene*, Chap. XXIX. C. V. Mosby Co., 1939.

UNIT IV**SAFE DRINKING WATER**

Time: 4 to 8 lessons

I. Objectives:

1. To learn the source and treatment of the water supply of the pupils' own city or town.
2. To learn the importance of a safe water supply.
3. To learn the qualities of good drinking water.
4. To learn the methods of purification of a water supply for a city, home or camp.
5. To know the characteristics of a properly built well.

II. Suggested Teaching Plan:

1. In how many ways is water used in your city?
 2. How much would we miss a water supply if it were suddenly cut off? (This may bring out the importance of water for the human body, for personal cleanliness, for growth of plants, and for manufacturing. The class may place a list of the uses of water in their notebooks.)

3. If you were a pioneer (or on a camping trip) what kind of water would you choose to drink? Where would you find it? (Drinking water should be colorless, odorless, tasteless, cool, soft, clear, free from iron, from lead or other poisons and from the germs of communicable disease.)

4. Can a city always secure water which possesses all the desirable qualities? If not, how may the water supply be purified? (This information must necessarily be supplied by the teacher, from textbooks, or from library research. Such processes as storage, slow sand filtration, mechanical filtration, the use of chlorine gas, aeration, and the use of copper sulphate may well be studied. Pupils may place in notebooks a brief outline of each method and diagram of the apparatus involved.)

5. How may small quantities of water be purified? (The subject of simple methods of water purification may be approached: (a) by a discussion of methods used by U. S. Army in the field or on the march. (b) by pupils telling of the practice of boiling all water which young brothers and sisters drink. (c) by imagining a situation (such as a camping trip) when a safe water supply cannot with certainty be found.) (By actual demonstrations, if practicable, the class may be taught such methods as boiling, the use of tincture of iodine and of prepared chemicals.)

6. If you lived in the country, away from a city or town water supply, where might you get drinking water? (Pupils may place in notebooks a diagram showing the formation of wells and springs, and of a well properly built and protected.)

7. Where does the water you drink come from? (If the water supply of the pupils own city or town furnishes a satisfactory example, it may be used as a basis for the entire subject of water supply. Otherwise, its discussion may serve as a means of review. The class may make diagrammatic or relief maps on cardboard or in notebooks to show the source of their own drinking water supply.)

8. How does the government make sure that drinking water supplies are safe? Where may a water supply be tested? (Supervision of water supplies by engineers, testing in state or city laboratories.)

9. What can boys and girls do to help keep a drinking water supply clean? (Care of springs, wells, reservoirs, and watersheds.)

10. How does ice form? How may ice be made artificially? Does freezing kill bacteria? (No.) What kind of ice should be put in cold drinks?

11. Describe the construction of a safe drinking fountain in your school or elsewhere. How should such a fountain be used?

III. Suggested Activities and Questions:

1. Bring to class samples of water containing algae.

2. Report to the class on a trip you have taken to the source of your own city water supply, to a water purification plant or to the State Water Laboratory.

3. Make a model of a slow sand filter using paper, clay or actual samples of different sizes of sand and small pipes.

4. Make a survey of drinking fountains in the vicinity of your school, noting which are of a satisfactory type.

5. Make a relief map showing source of a municipal water supply.

Pupil References:

ADDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit II, Ginn & Co., 1939.

BIGELOW & BROADHURST: *Health in Home and Neighborhood*, Chap. II. Silver, Burdett Co., 1930.

BROWNELL, IRELAND AND TOWNE: *Progress in Living*, Unit 4. Rand McNally & Co., 1935.

GREGG & ROWELL: *Health Studies—Home and Community*, Part II, Chap. X. World Book Co., 1936.

TURNER & COLLINS: *Community Health*, revised edition, Chap. IV. D. C. Heath & Co., 1935.

WINSLOW & HAHN: *The Healthy Community*, Chap. VII. Charles E. Merrill Co., 1934.

Teacher References:

PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science and Public Health*. Chaps. IX to XII.

SMILEY & GOULD: *Community Hygiene*, Chaps. VII & IX. Macmillan Co., 1935.

TURNER: *Personal and Community Health*, Chap. XXVI. C. V. Mosby Co., 1939.

Films:

Drinking Health. Loaned through Films of Commerce, Inc., Pathe Bldg., 35 W. 45th St., New York City.

City Water Supply, produced by Eastman Teaching Films.

New York Water Supply, produced by Eastman Teaching Films.

A Drink of Water } Loaned by Films Service, Boston University,
Beyond the Microscope } School of Education.

Purifying Water, loaned from the Division of University Extension, State Department of Education.

UNIT V

WHOLESOME FOOD SUPPLY

Time: 5 to 7 lessons

I. Objectives:

1. To know the source of the food and milk supply of the pupil's own family.
2. To learn how the purity and cleanliness of food supplies is safeguarded by our governmental agencies.
3. To review the facts regarding the relation of food to health.
4. To know why clean milk is important and how it may be secured.
5. To become familiar with the possible dangers from foods that are not kept scientifically clean.
6. To know and appreciate why food handlers at home and in public places should be clean in their habits and free from contagious disease.
7. To develop personal cleanliness in preparation and eating of foods.
8. To prevent contagion from reaching food directly by washing hands before eating.

II. Suggested Teaching Plan:

1. How is the food you eat related to your health? (Growth, repair, energy, warmth, resistance to disease.)
2. What types of food would you include in your diet each day? Give reasons why you would choose a varied diet. (Review food facts taught in earlier grades. There should be brief discussion of proteins, fuel foods, minerals, vitamins, roughage and water, with understanding as to what are the uses of these different food substances in the body. Students should be led to accept responsibility for selecting a satisfactory diet.)
3. How have food habits changed from colonial times to the present? (Each family used to produce most of its own food supply; now most families buy all their foodstuffs. Refrigeration and other methods of food preservation, as well as improved methods of transportation have made fresh foods available at all times to greater numbers of people. Compare the problems of food supply on a remote farm today with that of the average family in a large town or city.)
4. Why was it unnecessary to have community supervision of foodstuffs in colonial times? Why do we need government supervision of certain foodstuffs today? (Increased transportation, commercial food preservation [refrigeration, canning] make it necessary for government to supervise, since this cannot be done by any one individual.)
5. What is meant by adulteration of food? How do we protect ourselves against it?
6. Discuss the reasons for safeguarding the meat supply. How does the government do this? (Possibility of parasite infection with such organisms as trichina or tapeworm. Government inspection helps to prevent their occurrence in meat sold for food.)
7. Why do foods spoil or become unfit to eat? (Bring out the relation of molds and bacteria to food spoilage. Certain molds and bacteria are helpful, give flavor to some kinds of cheese; vinegar is made by the action on acetic acid bacteria; buttermilk and various sour milk drinks are produced by lactic acid bacteria. Care should be taken not to encourage a morbid attitude toward bacteria.)
8. Explain why cooking is a "sanitary measure".

9. Why would you prefer to buy cooked foods from a store where they are kept covered and protected from unclean handling? Would you demand the same care for fruits and vegetables? Why?

10. Why is the sanitation of the milk supply one of the most important items in food control? (Milk is the most important single food; large numbers of people often use milk from the same source; it tends to spoil quickly; it offers an excellent medium for growth of bacteria. Some diseases which may be spread by unclean milk are: tuberculosis, scarlet fever, septic sore throat, typhoid fever.)

11. Discuss the important steps in providing a safe milk supply. (Healthy cows, clean dairy, careful transportation, pasteurization.)

12. What is pasteurization? Why is it important to pasteurize milk?

13. Discuss certified milk, how it is produced and why it costs more than other milk. (Certified milk is a clean, raw milk produced under medical supervision. Students should appreciate that pasteurization makes it possible to secure *safe* milk without the high cost of certified milk.)

14. What are possible dangers in shellfish? (Infection from shellfish grown in polluted water.)

III. Suggested Activities and Questions:

1. Menu cards from local restaurants may be used in class for practice in selecting well balanced meals at moderate cost.

2. Menus for camping trips may be prepared by students and discussed in class.

3. If notebooks are kept, students may wish to list in them the different kinds of food substances and indicate some of the important sources of foods commonly used.

4. Five-minute speeches may be given by students on such subjects as the following: "Food Problems of Colonial Times as Compared with Food Problems of Today", "The Use of Milk in Other Parts of the World", "Pasteurization of Milk", "Some Ways in Which We Protect Our Food Supplies Through the Work of Our Local Government". Observe food cared for in stores.

5. Draw up a score card for ranking these stores on such points as refrigeration, cleanliness of shelves, counters, floors; absence of rubbish and garbage; screens; ventilation.

6. Simple experiments may be carried on at home or in school to show the relation of temperature to spoiling of milk.

7. Experiments may be conducted to show the relation of temperature to the growth of mold on food.

8. The class may visit a model dairy or pasteurization plant to observe methods of milk handling.

9. The film "Wisconsin Dairies", Eastman Teaching Films, Inc., may be used to advantage, if it is available.

10. If practicable, home methods of pasteurizing milk may be demonstrated.

11. A committee may be sent by the class to visit the health department to secure information as to what the local government does for protection of the food supply.

Pupil References:

ADDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit II, Unit III. Ginn & Co., 1939.

BIGELOW & BROADHURST: *Health in Home and Neighborhood*, Chap. I. Silver, Burdett & Co., 1930.

BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit 4. Rand, McNally & Co., 1935.

- GREGG & ROWELL: *Health Studies—Home and Community*, Part II, Chap. XI. World Book Co., 1936.
- TURNER & COLLINS: *Community Health*, Chap. V. Revised edition. D. C. Heath & Co., 1935.
- WINSLOW & HAHN: *Healthy Community*, pp. 32-35, 118-128, 230-232. Charles E. Merrill Co., 1934.
- WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chap. X. Thomas Nelson & Sons, N. Y. 1936.

Teacher References:

- BROADHURST & LERRIGO: *Health Horizons*. Silver, Burdett & Co., 1934.
- CHENOWETH & MORRISON: *Community Hygiene*, Chap. 7. F. S. Crofts Co., 1934.
- METROPOLITAN LIFE INS. Co., New York City. Teaching Unit on *The Nature of Bacteria*.
- PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science and Public Health*. Macmillan Co., 1935.
- SMILEY & GOULD: *Community Hygiene*, Chap II. Macmillan Co., 1935.
- TURNER: *Personal and Community Health*, Chap. XXV. C. V. Mosby Co., 1939.

Films:

- The Milky Way*—loaned by H. P. Hood & Sons, 500 Rutherford Ave., Charlestown, Mass.
- Story of Refrigeration*—loaned by Division of University Extension, State Department of Education.
- Meat Packing*—loaned by Division of University Extension, State Department of Education.

UNIT VI

WASTE DISPOSAL

Time: 4 to 6 lessons

I. Objectives:

1. To know how garbage, rubbish and ashes are disposed of in your town or city.
2. To become acquainted with the important methods of sewage disposal.
3. To understand how disease may be spread by careless disposal of sewage.
4. To apply the principles of waste disposal to problems of camping or life in rural sections.

II. Suggested Teaching Plan:

1. What kinds of wastes have to be disposed of in any household? (Food, rubbish, ashes, wash water, body discharges.)
2. How are ashes and rubbish disposed of in your city or town? (In other communities you have visited.)
3. How would you dispose of ashes and rubbish if you lived on a farm? (Dumping, using wood ashes as fertilizer, etc.)
4. What would you do with food wastes in the country?
5. How may garbage be disposed of in the city?
6. List the places in the home from which water wastes are discharged. (Sink, bathtub, lavatory, toilet, etc.)

7. What becomes of the various water wastes in homes and factories in the city? (Taken by sewerage system to river, lake, ocean or disposal plant.)

8. How does your city or town finally dispose of its sewage?

9. What is the average amount of sewage per day for every person in the city? (Usually about 100 gallons. The facts regarding sewage disposal in cities can be found in standard texts.)

10. At this rate, how much sewage per day has to be disposed of in your city?

11. What is the simplest method of sewage disposal for cities that are located on the coast? Name three cities that can dispose of their sewage in this way.

12. What may prevent cities situated on lakes and rivers from pouring their sewage directly into the water? (Pollution of water supply.)

13. Discuss the way in which waste spread upon the ground is turned back into soil. (Give examples of how wastes are used to enrich the soil. Emphasis should be given to the importance of bacteria in changing waste substance to soil.)

14. Can sewage be disposed of by spreading it on the ground? What is this type of sewage disposal called? (Sewage farming.) What are its advantages?

15. Why has it become necessary for many cities to purify their sewage before they can dispose of it? (Danger of polluting water supplies.)

16. Discuss the way in which sand is used for purifying sewage. What is such a filter called? (Intermittent sand filter.)

17. How are rock filters used in purifying sewage? (Sprinkling filter.)

18. What are the advantages and disadvantages of sand as compared with rock for sewage purification? (Consider rate of filtration, space required and completeness of purification.)

19. How is the actual work of purification effected in either rock or sand filter? (Sewage is purified by bacteria growing on the surface of the filter.)

20. Where are cesspools commonly used? What is the general construction of a cesspool?

21. What happens to sewage when it is left in cesspools or large tanks? (Emphasize the action of bacteria again in this instance. The bacteria are of a different kind in this case, however. They are able to secure oxygen for life from the sewage and do not require exposure to air as do the bacteria in sand and rock filters.)

22. How does nature complete the purification of sewage that is poured into a stream or lake after being partly purified by filtration or other methods?

23. Describe a case in which typhoid fever was widely spread because of carelessness in disposing of the body wastes from a person who had the disease. (References found in textbooks.)

24. Why are such epidemics uncommon now? (Purification of water and proper disposal of sewage.)

25. At the present time in this country is typhoid more common in the city or in the country? Why? (The country lacks efficient sewage disposal.)

26. In the country how can you be sure that the body wastes of the family will not endanger your own water supply or that of your neighbors? (Consult reference texts for "safe rules for camping.") Where can you get information on the proper way to build a sanitary privy? (The important consideration in building a sanitary privy will be found in the texts given in the reference lists. Since students of this age are not responsible at this time for the building of privies, the details need not be dealt with here. Detailed information can be secured at any time from the State Department of Public Health.)

27. What rules for disposing of waste and safeguarding the water supply would you follow when camping? (Avoid polluting a water supply. Be sure the drinking water is pure.)

III. Suggested Activities:

1. If practicable, the class may visit the sewage disposal plant of their own city. (An oral report may be presented by chosen members of the class on their return. Have discussion on various phases of the sewage disposal plant when the oral report has been given.)

2. A committee from the class may visit the proper city offices to find out what methods of sewage disposal are used and whether they are considered satisfactory. An oral report may be presented to the class by the committee. Have class discussion on the report.

3. Secure from city reports figures showing expenditures for the various forms of waste disposal. From these figures may be computed the cost per person.

4. Students may construct a model map or diagram of the sewage disposal plant of their own city or a plant described in a text.

5. Drawings may be made to show the system of plumbing in a dwelling house and the connection to a sewer. Also, the construction of a cess-pool may be investigated.

6. Such topics as the following may be used as subjects of English composition or oral reports: "Early Experiments with Sand Filtration at Lawrence, Mass.", "The Story of a Typhoid Fever Epidemic", "Safe Disposal of Wastes in Camping".

7. Students may insert in notebook a set of the rules for safe disposal of wastes when camping.

8. The class may promote a program for keeping the school building and yard free from litter.

9. If the class is organized under a Board of Health, this program may properly be developed as part of the Board of Health activities.

Pupil References:

ANDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit VI, Ginn & Co., 1939.

BIGELOW & BROADHURST: *Health in Home and Neighborhood*, p. 259, 226-248. Silver, Burdett & Co., 1930.

BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit 3. Rand, McNally & Co., 1935.

GREGG & ROWELL: *Health Studies—Home and Community*, Chap. IX. World Book Co., 1936.

TURNER & COLLINS: *Community Health*, Chap. VII. D. C. Heath & Co., 1935.

WINSLOW & HAHN: *The New Healthy Living*, Chap. XII. Charles E. Merrill & Co., 1935.

Teacher References:

CHENOWETH & MORRISON: *Community Hygiene*, Chap. VIII. F. S. Crofts & Co., 1934.

PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science and Public Health*, Chaps. VII-VIII. Macmillan Co., 1935.

TURNER: *Personal and Community Health*, Chap. XXVII. C. V. Mosby Co., 1939.

Films:

Sewage Disposal—may be purchased from the Eastman Kodak Co., Teaching Films Division, Rochester, N. Y., or loaned by Division of University Extension, State Department of Education.

Waste Disposal—loaned by Division of University Extension, State Department of Education.

UNIT VII

RODENT AND INSECT CONTROL

Time: 3 to 5 lessons

I. Objectives:

1. To learn the difficulty of keeping pigs, hens or other domestic animals in congested communities.
2. To learn the dangers from rats and mice and to know general methods of getting rid of them.
3. To know why flies are a menace to health and how fly breeding can be prevented.
4. To know how mosquitoes breed, why they are harmful and what are the effective methods of mosquito control.
5. To recognize the parts which the individual and the community play in controlling rodents and insects.

II. Suggested Teaching Plan:

1. Would you object to your neighbor in the country keeping hens, pigs or cows? Why?
2. Would you object to having your city neighbor keeping hens or a pig? (While disagreeable odors do not carry disease, they do cause discomfort and are therefore regarded as a health nuisance. Also, the keeping of domestic animals in congested districts is directly harmful because of the breeding places of flies.)
3. Why do you try to keep rats and mice out of your home? What are the best methods for keeping them out and for getting rid of them in case they do get in?
4. What disease may be carried by rats? (Plague.) Why? Discuss the way in which the disease is carried from rats to human beings.
5. How have we protected ourselves in this country against infested rats from other countries? (Destruction of rats. Government supervision for preventing rats from coming in from ships.)
6. What methods are used by cities to get rid of rats? (Fumigation, trapping, rat-proofing buildings and care of garbage and rubbish.)
7. How can individuals help to keep their community free from rats?
8. Review the stages in the life history of the house fly.
9. Discuss the reason why flies are undesirable. (Carry disease.)
10. What is done to keep your home free from flies?
11. What community activities help to protect the people of the community from flies?
12. Discuss the reasons why mosquitoes are undesirable. (Bites. Carriers of certain diseases.)
13. How do mosquitoes breed and develop? (Review here the life history of mosquitoes.)
14. What can you do to help protect yourself and other people in your neighborhood from mosquitoes? (Killing adult mosquitoes. Getting rid of such breeding places as tin cans and rain barrels.)
15. How does the community make war on mosquitoes? (Controlling breeding places. Killing larvae and using oil or poisons. Introducing larvae-eating fish.)
16. At what time of year is the killing of adult flies and mosquitoes most effective? Why?

III. Suggested Activities:

1. Groups of students may inspect their own neighborhoods for fly-breeding and mosquito-breeding places which may be recorded on a spot map. The class may discuss the problems and take what action is within their means for getting rid of these breeding places.

2. A campaign may be carried on during the spring months for the killing of adult flies and mosquitoes.

3. Students may secure from their local Health Department information about the amount of money spent in their community for mosquito control in the past year and what work was done.

4. If a mosquito control project is being carried on in the vicinity of your community, the class or individual students may visit the scene of activities and report on their findings.

5. Films on mosquitoes and flies may be used to advantage.

6. The story of Walter Reed and his work in connection with yellow fever and of General Gorgas and mosquito control in the Panama Canal Zone may be used for supplementary reading or for class report.

Pupil References:

ADDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit VI, Chap. XXXIII. Ginn & Co., 1939.

BIGELOW & BROADHURST: *Health in Home and Neighborhood*, pp. 221-225; 260-262. Silver, Burdett & Co., 1930.

BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit 3. Rand, McNally & Co., 1935.

CHARTERS, SMILEY & STRANG: *The Body Needs*, pp. 333-344. Macmillan Co., 1935.

GREGG & ROWELL: *Health Studies—Home and Community*, Chap. VII. World Book Co., 1936.

TURNER & COLLINS: *Community Health*, Chap. VIII.

WINSLOW & HAHN: *The New Healthy Living*, Chap. XX. Charles E. Merrill Co., 1935.

WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chap. VIII. Thomas Nelson & Sons, N. Y. 1936.

Teacher References:

CHENOWETH & MORRISON: *Community Hygiene*, Chaps. IX, X. F. S. Crofts & Co., 1934.

PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science and Public Health*, Chaps. XVIII, XIX, XX. Macmillan Co., 1935.

SMILEY & GOULD: *Community Hygiene*, Chap. IV. Macmillan Co., 1935.

TURNER: *Personal and Community Health*, Chap. XXII. C. V. Mosby Co., 1939.

ZINSSER: *Rats, Lice and History*. Little, Brown & Co., 1935.

Films:

The House Fly—sold by Eastman Teaching Films, Rochester, N. Y.
Life History of the Yellow Fever Mosquito—loaned by Division of University Extension, State Department of Education.

UNIT VIII

SWIMMING POOLS AND BATHING BEACHES

Time: 1 lesson

I. Objectives:

1. To understand the importance of clean swimming pools and bathing places.

2. To know the way in which the sanitation of these places is controlled by the work of governmental agencies.

3. To develop individual responsibility for cooperating to keep bathing places in good condition.

II. Suggested Teaching Plan:

1. Where do people go swimming in or near your community?
2. Can you personally be certain that places where you go swimming are clean? Can you help to keep them clean by regulations and individual cooperation?)
3. How do we know that the water at our bathing beaches is safe for us to swim in? (Water analysis. Control by the Health Department.)
4. How is the water in swimming pools kept safe? (Filtration. Addition of chlorine or ozone.)
5. Do you think that it is worth while for a community to spend money in order to provide clean swimming pools and bathing places?
6. Secure from your local Health Department a list of swimming pools and bathing places which it supervises. These places may be located on a map. Prepare an oral report on the kinds of safety activities carried on at these supervised pools.
7. Make a list of health rules for safe swimming. What first-aid procedures would you use in case of a drowning accident?

Pupil References:

- BROWNELL, IRELAND & TOWNE: *Progress in Living*, pp. 120-122. Rand, McNally & Co., 1935.
- BIGELOW & BROADHURST: *Health in Home and Neighborhood*, p. 292. Silver, Burdett & Co., 1930.
- TURNER & COLLINS: *Community Health*, pp. 103-104. D. C. Heath & Co., 1935.
- WINSLOW & HAHN: *The New Healthy Living*, pp. 391-394. Charles E. Merrill Co., 1932.

Teacher References:

- CHENOWETH & MORRISON: *Community Hygiene*, p. 41. F. S. Crofts & Co., 1934.
- PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science and Public Health*, pp. 181, 192-198. F. S. Crofts & Co., 1934.
- SMILEY & GOULD: *Community Hygiene*, Chap. 7. Macmillan Co., 1935. Revised edition.

Films:

- First Aid—Life Saving and Resuscitation*—loaned by Division of University Extension, State Department of Education.
- Every Swimmer a Life Saver*—for rent or sale from National Safety Council, 20 No. Wabash Drive, Chicago, Ill.
- Artificial Respiration*—for rent or loan or sale from National Safety Council, 20 No. Wabash Drive, Chicago, Ill.

UNIT IX

HOUSING

Time: 1 or 2 lessons

I. Objectives:

1. To know the requirements of a house which affords a healthful place in which to live.
2. To become acquainted with the problems of housing in large communities.

3. To know how the government works to promote good housing conditions in large communities.

4. To accept responsibility for cooperating to keep one's home and neighborhood clean.

II. Suggested Teaching Plan:

1. What health standards would you set up for a home in which you were going to live? (Consult recent books and articles for materials on better housing in America.)

2. Why do city governments need to regulate housing conditions? How is it useful in promoting the public health? (Protection of residential areas from odors, dust and noise. Preventing the use of houses which are injurious to health because of poor ventilation or sanitation.)

3. What may citizens do to keep their neighborhood healthful?

4. What are the zoning laws, if any, of your town or community?

III. Suggested Activities:

1. Find out regulations governing housing in your city.

2. The class may make a map of their own of an ideal community showing good zoning arrangement.

3. What methods does your own or some other city or town government use for controlling such nuisances as odors, dust, smoke and noise?

4. Are these a problem in your community? If so, what things cause the most noise? How might they be controlled?

Pupil References:

ANDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit I. Ginn & Co., 1939.

BIGELOW & BROADHURST: *Health in Home and Neighborhood*, Chaps. III to V. Silver, Burdett & Co., 1930.

BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit 2. Rand, McNally & Co., 1935.

GREGG & ROWELL: *Home and Community*, Chap. XIII. World Book Co., 1936.

Teacher References:

PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science and Public Health*, Chap. XXIII. Macmillan Co., 1935.

UNIT X

DISEASE PREVENTION

Time: 7 to 9 lessons

I. Approach Questions:

1. How would it be possible to prevent the spread of communicable diseases?

2. Is it anybody's business but your own if you have poor health?

II. Objectives:

1. To become acquainted with ideas that have been held in the past as to the nature of disease, and with the real nature of disease.

2. To learn the nature and value of vaccination against smallpox, immunization against diphtheria and against typhoid fever.

3. To realize the prevalence of tuberculosis during the 'teen age and the way in which it can be prevented.
4. To learn the use and importance of quarantine and isolation.
5. To recognize the place of proper sanitary measures in protecting us against communicable diseases.
6. To appreciate the importance of educating people in matters of health.

III. Suggested Teaching Plan:

1. Discuss some of the superstitions people still believe regarding disease and health. What are some of the ideas that have been held in the past as to the nature of disease? (Belief in demons, belief that odors cause disease.) Point out that present-day superstitions are as ridiculous as those of the past, considering the protection we have today from our constantly increasing fund of scientific knowledge of disease and public health.

2. Compare the methods of keeping people well today with those of a few hundred years ago. (Scientific medicine and surgery vs. magic.) What is done in your school to keep pupils well? Is the average length of life decreasing or increasing? (Fewer communicable diseases, fewer infant deaths, better medical skill, more hygienic living.) What are the important factors in keeping people well today? (A wider understanding of health and disease; scientific medical service; community health activities.)

3. Visit your Health Department and learn about some of the activities carried on in their effort to protect the community from communicable diseases. (Sanitation, insect control, immunization, quarantine and isolation.) Visits should be made to the Health Department by small committees who have previously made an appointment for their visit. The committee should also prepare questions which they wish to have answered. Upon their return each member of the committee should report upon certain phases of the work and the remainder of the class should take notes about this report in their notebooks.) When do mosquitoes breed in your community? In what part of our country is mosquito control an important item in keeping people well? Why? (Malaria and yellow fever mosquitoes live in the South.) Should a health officer try to keep his community free from flies as well as from mosquitoes? Why? (Flies carry germs mechanically.)

4. Is a person who has had measles once likely to contract the disease again? (Body produces defense or immune substance.) What name is given to this condition in which a person cannot catch a communicable disease because of specific defense in the body? (Start discussion from the student's own knowledge of condition of immunity.) Discuss the way in which the body develops immunity against a particular disease. (Discuss the battle between germs and the body. The germs produce substances that harm the body, and the body produces substances to kill the germs. Some of the protection remains in the body, providing immunity against future attacks of the disease.) Is it possible to become immune to a disease without actually having the disease? How? (Draw here from the experience of the pupils in being immunized against smallpox and diphtheria.)

5. Discuss the process of vaccination. When should vaccination be given? (During the first year of life and again at the time of entering school.) Have you been vaccinated? How long ago? Is vaccination compulsory in your state? Discuss the reasons why it is desirable to have compulsory vaccination.

(Seriousness of smallpox and the dangers of epidemic when a considerable part of the population are not vaccinated. Students should be led to realize that smallpox has become a rare disease in Massachusetts because of widespread vaccination, and that it can be prevented in the future only by a continuation of vaccination.)

6. How can one be immunized against diphtheria? Discuss the process of immunization. (Toxin-antitoxin or toxoid.) Does your city help children to be immunized against diphtheria? How does widespread immunization against this disease in a city affect the number of cases of diphtheria?

What is the source of vaccine and toxoid in Massachusetts? (State Laboratories)

7. Is there any method of immunization against tuberculosis? (No.) Is it important for a boy or girl in the 'teen age to know how to prevent tuberculosis?

(Tuberculosis is still the leading cause of death between the ages of 15 and 25. It is desirable that the subject of tuberculosis shall be presented in a manner which shall not frighten pupils but which will make them realize that with care tuberculosis is a preventable disease.)*

Why should all junior high school pupils have the tuberculin test and X-ray?

Is the form of tuberculosis most common in children the same as that found in adults? (Children usually have the childhood type of tuberculosis. The medical profession now speaks of the first infection as the childhood type of tuberculosis and of the reinfection as the adult type. The first type is of no particular moment as far as immediate impairment of health is concerned, but it has grave potentialities. The second type or the reinfection, may cause serious illness. Members of the medical profession and all health authorities feel that in order to make further progress in combatting the ravages of this disease, the attack must be made during the stage of the first infection. One must not wait until reinfection occurs; in short, reinfection must be prevented. Reinfection may occur from within by the breaking down of the old incompletely healed glands and the releasing of bacilli, or from without, by frequent contact with individuals who have the germ in their sputum.)

8. Is typhoid fever common in Massachusetts? How has the amount of typhoid fever been reduced? (Sanitation.) If you were going to a place where there was danger of typhoid fever what would you do? (Immunization.)

9. Were you ever quarantined or isolated because of communicable disease? Discuss what is meant by quarantine and isolation, and the reasons for their use.

(A mock trial may be held regarding a violation of the health laws. See p. 21, *Home and Community*, Gregg and Rowell.)

Do you think that it is right that persons in a family where there is a communicable disease should be isolated? Should the common cold be considered a communicable disease? What should you do when you have a cold?

10. How does sanitation help to protect people from disease? (Review.) How does education in matters of health help to keep persons well? (By showing them how to live healthfully. Persons are more likely to obey laws if they are shown why the laws are desirable.)

How can annual health examinations help to keep people well? (Early discovery of defects and disease.)

Do you have an annual health examination? When was your last examination made?

*Since the law of Massachusetts requires the subject of tuberculosis to be taught in all public schools, and since tuberculin testing is now being offered to high school pupils in Massachusetts, it is suggested that a separate teaching unit on "Preventing Tuberculosis" furnished by the Massachusetts Tuberculosis League, 1148 Little Building, Boston, be used.

IV. Suggested Activities:

1. The lives of Pasteur and Jenner may be used as subjects for study in written or oral English.
2. The class may examine the chart "Milestones on Public Health in America" and develop a topical summary of all the ways in which community health activities help to keep people well.
3. Pupils may list as many ways as possible in which they individually can cooperate with community activities to help in keeping people well.
4. The class may secure from their local Health Department the rules relating to prevention of disease and discuss them in class.
5. Pupils may list the activities that are carried on in their own community for the prevention of diphtheria, tuberculosis, smallpox, measles, scarlet fever and whooping cough.
6. A carefully prepared unit for teaching the nature of bacteria and their relation to disease can be secured from the Metropolitan Life Insurance Co., 1 Madison Ave., New York City, free of charge.
7. Motion pictures "Diphtheria" and "Tuberculosis and How It May be Avoided" may be borrowed without charge from the Massachusetts Department of Public Health, and "Man against Microbe" and "One Scar or Many" may be borrowed from the Metropolitan Life Insurance Company, New York City. (The latter film deals with smallpox.)
8. Objective tests of the true-false or multiple choice type may be developed and used as a checkup on knowledge at the close of work on this unit.

Pupil References:

- ANDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit VII, Ginn & Co., 1939.
- BIGELOW & BROADHURST: *Health in Home and Neighborhood*, Chap. VII, Silver, Burdett & Co., 1930.
- BROADHURST & LERRIGO: *Health Horizons*, pp. 109-283, 399-426. Silver, Burdett & Co., 1931.
- BROWNELL, IRELAND & TOWNE: *Science in Living*, Units 1 and 6. Rand, McNally & Co., 1935.
- GREGG & ROWELL: *Health Studies*—Part II, Chaps. 2 to 6. World Book Co., 1936.
- TURNER & COLLINS: *Community Health*, pp. 108-125. D. C. Heath & Co., 1935.
- WINSLOW & HAHN: *The New Healthy Living*, Book II, Chaps. 16-19. Charles E. Merrill Co., 1935.
- CHARTERS, SMILEY & STRANG: *Health Through Science*, pp. 100-109, Macmillan Co., 1935.
- CHARTERS, SMILEY & STRANG: *The Body's Needs*, pp. 195-204. Macmillan Co., 1935.
- WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chaps. III to V, Thomas Nelson & Sons, N. Y., 1936.

Pamphlets:

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|-------------------------------------|-----------------------------------|------------------------------------|
| <i>Health Through the Ages</i> | } Metropolitan Life Insurance Co. | |
| <i>Man's Fight against Disease</i> | | |
| <i>Tuberculosis from 5-20</i> . . . | | |
| | | Massachusetts Tuberculosis League. |

Teacher References:

- DOWNING: *Science in the Service of Health*. Longmans, Green & Co., 1930.
- CHENOWETH & MORRISON: *Community Hygiene*, Chaps. III to VII, IX-XVII. F. S. Crofts & Co., 1934.
- PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science and Public Health*, Chaps. II to V, VII to IX. Macmillan Co., 1935.
- TURNER: *Personal and Community Health*, Chaps. XXI to XXIV, C. V. Mosby Co., 1939.

Films:

- Diphtheria*—loaned by B. U. School of Education, Film Service, or the State Department of Public Health.
- Behind the Shadows*—(sound or silent) loaned by the Massachusetts Tuberculosis League.
- Man Against Microbe*—(sound or silent) loaned by the Metropolitan Life Insurance Co.
- Disease Carriers*—purchased from Herman A. DeVry, Inc., 1111 Center St., Chicago, Ill.
- How Disease Is Spread*—purchased from Bray Pictures Corp., 729-7th Ave., New York City.

UNIT XI

THE HEALTH DEPARTMENT

Time: 2 or 3 lessons

I. Approach Question:

1. Is it cheaper for your community to promote good health than to cure disease?

II. Objectives:

1. To appreciate the importance of Health Department activities.
2. To become acquainted with the local Health Department and its work.
3. To learn something of the activities of the State Department of Public Health.
4. To know what divisions of the federal government carry on activities in the field of public health.
5. To become familiar with the important private health agencies that contribute to community welfare.

III. Suggested Teaching Plan:

1. If you were the health officer of your city what would you have to do?
 2. Who is the head of your Health Department? Do you know any other persons connected with the department? What is their work?
 3. What things have you known your Health Department to do? If you were health officer of your city, would you want the people of your city to be familiar with the work of your department? Why? As a voting citizen of your city would you wish to be acquainted with the work done by your health department? Why?
 4. What are the general duties and powers of a city health department? (Sanitation, communicable disease control, popular health instruction.)
- Organize a health department in your class, allowing each pupil to select the division in which he is most interested.

5. Discuss the organization of a large city health department. What is meant by the Board of Health? Draw a diagram showing the activities of the health department. What does the Health Officer do?

6. What are some of the ways in which the Health Department prevents the spread of communicable disease? (Quarantine, isolation, education, supervision of food handlers and sanitation.)

What two communicable diseases can be controlled through immunization? (Smallpox and diphtheria.)

7. What type of hospital is commonly provided by the Health Department? (Communicable disease hospital.)

How does it help to protect the health of the community?

8. What kind of tests are made in the laboratories of the Health Department? (Water, milk, foods, and diagnostic tests for tuberculosis, diphtheria, scarlet fever, pneumonia, septic sore throat and a few other diseases.)

9. Discuss the reasons why the health department today is more effective in its work than it was before the time of Pasteur.

10. What work is done by the health department in connection with food? (Control of sale of food and of food handlers.)

11. What is meant by sanitation? How does the health department maintain the sanitation of the community? (Control of water supply, waste disposal, food supplies, nuisances.)

12. What services are provided by the health department for the promotion of child welfare? (Popular health instruction, clinics, day nurseries, school health service.)

13. How does the work of the public health nurse differ from that of the private nurse? (Instruction in the home regarding hygiene, infant care or the care of the sick. She may or may not do bedside nursing.)

14. Examine the pamphlet, "Seeing Is Believing."

15. How is health information spread by the health department? (Newspapers, bulletins, lectures, moving pictures, radio, exhibits.)

Why is this an important activity?

16. On what qualifications should a health officer be chosen?

17. Should he be chosen because he is a friend of some politician? In what lines of work should he be trained? (Disease control, sanitation, law enforcement, laboratory control, health education.)

Secure information as to the organization of your local Health Department and its various activities. Discuss your findings in class.

18. Where is your State Department of Public Health located? What are some of the services that it renders to the people of the state?

19. Discuss the work of the U. S. Public Health Service. (Preventing disease from coming into the country, research, demonstration of health practices, assistance to states.)

20. What other branches of the federal government carry on some health work? (Department of Labor, Children's Bureau, Department of the Interior, Office of Education; Department of Agriculture, Bureau of the Census, Army and Navy. See standard texts for activities.)

21. What private organizations provide services in your community to help keep people well? How do these receive their financial support? Discuss their activities.

IV. Suggested Activities:

1. The local health officer may be invited to talk to the class about what his department is doing for the health of the community.

2. A committee may be chosen by the class to visit their local health department to secure information as to its organization and activities. The class may discuss the committee report and prepare brief records for their notebooks.

3. Different groups from the class may visit local private health agencies that carry on public work in the community and report to the class.

4. The class may write to the local health department and the U. S. Public Health Service to find out what literature they have for free distribution. From these lists students may select a few to secure for class study. Teachers may write to the State Department of Public Health for sample set of printed material and order blank.

5. A simple objective test of the true-false, multiple choice, or completion type may be used to test knowledge at the close of work on this unit.

Pupil References:

- ANDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit X, 1939.
- BIGELOW & BROADHURST: *Health in Home and Neighborhood*, pp. 285-316. Silver, Burdett & Co., 1930.
- BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit 7, Rand, McNally & Co., 1935.
- CHARTERS, SMILEY & STRANG: *Adventures in Health*, pp. 138-151. Macmillan Co., 1935.
- GREGG & ROWELL: *Health Studies*, Part II, Chap. I, World Book Co., 1936.
- TURNER & COLLINS: *Community Health*, pp. 148-169. D. C. Heath & Co., 1935.
- WINSLOW & HAHN: *The New Healthy Living*, Book II, Chap. XXVIII, Charles E. Merrill, 1935.
- WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chap. VI, Thomas Nelson & Sons, N. Y. 1936.

Teacher References:

- CHENOWETH & MORRISON: *Community Health*, Chap. XIX, F. S. Crofts & Co., 1934.
- PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science*, Chaps. XXV, XXVIII, Macmillan Co., 1935.
- SMILEY & GOULD: *Community Hygiene*, Chaps. I, II, and XV, Macmillan Co., 1935.
- TURNER: *Personal and Community Health*, Chap. XXIX, C. V. Mosby Co., 1939. Revised edition.

Film:

Serving the Community—Purchased from Herman A. DeVry, Inc., 1111 Center St., Chicago, Ill.

UNIT XII

CHILD WELFARE

Time: 2 or 3 lessons

I. Approach Question:

1. May older brothers and sisters help in any important way to care for children?

II. Objectives:

1. To appreciate the relation of care in infancy to health in later life.
2. To learn what is involved in the healthful care of the baby.

3. To become acquainted with some of the ways in which community health activities contribute to infant welfare.

4. To accept personal responsibility for cooperating in the care of younger brothers and sisters in the home.

III. Suggested Teaching Plan:

1. How does the length of childhood compare with the time required for the full development of the lower animals? (Relatively long.)

2. What are some of the important physical and mental goals that you should think desirable for boys and girls to attain during childhood? (Free from defects, satisfactory growth, vigorous health, certain skills, likable disposition.)

3. Why is infancy a period when healthful care is of vital importance? (Rapid physical and mental growth, lack of resistance to disease, the importance of being started in good physical and mental habits.)

4. Discuss briefly the important items in feeding the baby. (Such as the advantages of mother's milk, the value of fruit juices, vegetables and cereals, vitamins and the danger of sweets in the diet.)

5. Discuss the value of direct sunlight for babies. Describe some of the methods you have seen used by mothers to give their babies exposure to direct sunlight. What precautions must be taken in summer? In winter?

6. How can a mother help her baby to develop good teeth? (The quality of second teeth is very largely determined by the diet of the first six years. Dangers of thumb sucking. The desirability of early dental care.)

7. Why should babies be protected against communicable diseases? (Diseases of childhood are much more serious for babies and runabouts than for older children.)

What diseases can be avoided by early immunization? (Diphtheria and smallpox.)

8. Discuss the ways in which community health activities that you have already studied help to provide conditions favorable to infant health. (From class discussion a list of activities that contribute to infant health may be drawn up, including items regarding milk control, water supply, waste disposal, good housing and communicable disease control.)

9. Discuss the importance of the family physician in helping to keep the baby well.

10. How does the community provide help for families who are unable to keep their babies under the care of a private physician? (Baby clinics, public health nursing, health department booklets.)

What special services does your City Health Department provide to help keep babies of the community well?

What other activities are carried on in your city to promote infant health? (Local unofficial agencies.)

11. How can reliable information on baby care be secured? (Students will recognize that valuable first-hand information is secured through the family physician, clinic, State Department of Public Health, City Health Department.)

12. Is it worth while to spend community money for infant welfare? Why?

13. Discuss the responsibilities of older brothers and sisters for co-operating in infant care in the home. (Refrain from feeding sweets to the baby, avoid exciting play at bedtime, avoid kissing the baby on the mouth, and keeping away from the baby when one has a cold.)

IV. Optional or Supplementary Activities and Questions:

1. Students may draw up a list of the health habits that have been brought to their attention by the discussion of infant care.
2. A list of important rules for the care of the baby in the home may be developed out of class discussion, and recorded in the students' notebooks.
3. Different groups from the class may visit the local Health Department and other agencies carrying on infant welfare work in the community to secure general reports of their activities. The class may discuss the committee reports and place brief accounts of the infant welfare activities in their notebooks.
4. Teachers may write to the State Department of Public Health for sample set of printed material on infant care.

Pupil References:

- BIGELOW & BROADHURST: *Health in Home and Neighborhood*, Chap. VIII, Silver, Burdett & Co., 1930.
- ANDRESS & EVANS: *Health and Good Citizenship*, Chap. XXVI, Ginn & Co., 1933.
- BROADHURST & LERRIGO: *Health Horizons*, pp. 69-89. Silver Burdett & Co., 1931.
- CHARTERS, SMILEY & STRANG: *Adventures in Health*, pp. 179-192. Macmillan Co., 1935.
- TURNER & COLLINS: *Community Health*, pp. 139-147. D. C. Heath Co., 1935.
- WINSLOW & HAHN: *The New Healthy Living*, Book II, Chap. XXIII, Charles E. Merrill Co., 1935.
- WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chap. XIV. Thomas Nelson & Sons. 1936.

Teacher References:

- CHENOWETH & MORRISON: *Community Hygiene*, Chap. XIX, F. S. Crofts & Co., 1934.
- DWYER: *Your Child in Health and in Sickness*. Alfred A. Knopf, 1936.
- PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science*, Chap. 16, Macmillan Co., 1935.
- SMILEY & GOULD: *Community Hygiene*, Chap. 17. Macmillan Co., 1935.
- TURNER: *Personal and Community Health*, Chap. XXX. C. V. Mosby Co., 1939.

Films:

- Little Brothers and Sisters*—rented by Visual Education Service, 131 Clarendon St., Boston, Mass.
- A Healthy Child* (1 reel)—Loaned by Massachusetts Department of Public Health, Boston, Mass.

UNIT XIII

VENTILATION

Time: 2 or 3 lessons

I. Approach Question:

1. How are pupils in a room affected when the ventilation is poor?

II. Objectives:

1. To appreciate the value of good ventilation for health and efficiency, and the ill effects of poor ventilation.
2. To understand how the body maintains its temperature, and the effect of ventilation on this process.
3. To know what are the elements of good ventilation and to share the responsibility for securing them.
4. To know that good ventilation is important in helping to prevent colds.
5. To appreciate the value of sunlight for health.

III. Suggested Teaching Plan:

1. How much time each day do you spend out of doors? How does outdoor air affect you when you go out after a long time indoors?

2. How does indoor air affect you when you enter a room that is hot and stuffy?

3. How would you describe the air in a room that seems pleasant and comfortable to you as you enter from outdoors? (Right temperature, free from odors, moving air.)

4. What is ventilation?
(The process of getting fresh air into buildings. "Ventus" is the Latin word for wind.)

5. How does the body maintain its even temperature? (Review from previous grades to help understand the physiological values of good ventilation.) How does the cool crisp air of a winter day affect you? How do you feel on a hot day in summer? Compare the effect of a hot summer day with that of overheated rooms. What temperatures are best for effective work? (68 degrees F. or below according to type of work and moisture in the air. 70 degrees only in a very dry moving air.)

How do heavy sweaters and leather jackets worn indoors affect the ventilation of the skin? Compare the effects of heavy clothing worn indoors with the effect of hot summer weather.

If available, read the story of the Black Hole of Calcutta as an extreme example of what happens when the body is unable to cool itself.

Do you know what changes take place in the body when a person is confined in a small chamber where the air is very hot, moist and still?

6. Discuss the qualities which indoor air should possess in order to be satisfactory for health and comfort. (Temperature, humidity, movement, free from dust, fumes and odors.)

7. Discuss the ways in which the rooms of a home or a school can be kept properly ventilated. (Windows, air conditioning.) What is meant by window ventilation for classrooms? What are its advantages? What are the difficulties and how may they be overcome? (See standard text.) What is meant by mechanical ventilation? What are its advantages and disadvantages?

Should the temperature of mechanically ventilated rooms be higher or lower than that of window ventilated rooms? Why? (Higher, because air is moving more rapidly.) How is your classroom ventilated? Is the ventilation satisfactory? If not, what are the difficulties? How is your home ventilated? At what temperature is it kept?

How do you ventilate your bedroom at night? Discuss the relation of fresh air to sleep.

8. Why is it necessary for some factories to have a special type of ventilation? (Dust and humidity.)

9. How is sunlight related to health? Is there any difference between sunlight indoors and outdoors?

IV. Suggested Activities:

1. Students may cooperate with the teacher in keeping a record of classroom temperature and in adjusting temperature conditions.
2. A campaign may be conducted to popularize the removal of heavy sweaters, coats and leather jackets in the classrooms.
3. Simple diagrams which show the difference between window ventilation and mechanical ventilation may be placed in notebooks.
4. If practicable, the class may be allowed to inspect the school heating and ventilating plant at a time when the custodian can explain it to them.
5. Students may make a visit to factories or public buildings to learn about the ventilating system of those places and report to the class.

Pupil References:

- ADDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit I, Ginn & Co., 1939.
- BIGELOW & BROADHURST: *Health in Home and Neighborhood*, pp. 170-188. Silver, Burdett & Co., 1930.
- BROADHURST & LERRIGO: *Health Horizons*, pp. 1-45, 438. Silver Burdett & Co., 1931.
- BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit 2, Rand, McNally & Co., 1935.
- GREGG & ROWELL: *Health Studies*, Part II, pp. 258-262. World Book Co., 1936.
- WINSLOW & HAHN: *The New Healthy Living*, Book II. Chap. IX, Charles E. Merrill Co., 1929.
- WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chap. VII, Thomas Nelson & Sons, N. Y. 1936.

Teacher References:

- CHENOWETH & MORRISON: *Community Hygiene*, Chap. 28, F. S. Crofts & Co., 1934.
- PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science*, Chap. XXI, Macmillan Co., 1935.
- SMILEY & GOULD: *Community Hygiene*, Chap. XXVIII, C. V. Mosby Co., 1935.
- TURNER: *Personal and Community Health*, Chap. XXVIII, D. C. Heath & Co., 1939.
- WILLIAMS: *Healthful Living*, pp. 361-364. Macmillan Co., 1934, revised edition.
- WILLIAMS & OBERTEUFFER: *Industrial Hygiene for Schools*, pp. 82, 86, 88, 179. McGraw-Hill Book Co., 1930.

UNIT XIV

RESPONSIBILITY OF TOWN OR CITY FOR RECREATION

Time: 4 or 5 lessons

I. Objectives:

1. To appreciate that play is a fundamental need of all people.
2. To understand the changes in opportunities for outdoor play that have come about with the increase of population in cities. Why?
3. To realize that the city must make provision for play and recreation and to learn some of the ways in which it can be done.

4. To appreciate the vital importance of play and recreation in relation to physical and mental health or both.
5. To know the advantages of outdoor activities and to seek daily recreation outdoors so far as possible.
6. Define the term recreation.

II. Suggested Teaching Plan:

1. Is play an activity that is peculiar to modern life? (Discuss the place of play in the old civilization of the world. Compare the two briefly.)
2. How were the play activities of your father's and of your grandfather's childhood different from yours? In what ways were they like yours? (Show or relate the benefits.)
3. Discuss the difference between the play opportunities of children in the country and those of children in a crowded section of a city.
4. What differences are there between the work of people in the country and in the city?
5. Is recreation a community problem in cities? Why? (Space must be made available.)
6. What are some of the ways in which cities provide opportunity for children to play? For adult recreation?
7. Is it worth while for the city government to provide opportunities for children to play? Why? For adults? Why?
8. Do private organizations such as Boy Scouts and Y. M. C. A. provide opportunities for children to play? Make a list of such organizations and their work.
9. Discuss the public playgrounds with which you are acquainted. What are their advantages? Disadvantages?
10. Discuss some of the best city parks that you know. What opportunities for recreation are furnished by these parks?
11. What opportunities does your school provide for play and recreation? List the kinds of recreation that you enjoy through your school.
12. Where do you play outside of school hours? Where do the younger children of the community play? (Safety problems peculiar to locality.)
13. How much time did you spend in outdoor recreation yesterday? Make a checkup in the class to determine how many spent more than an hour in outdoor play, how many spent less than an hour, and how many had no outdoor recreation. (Individual charts may be made.)
14. What did you do in your time of outdoor recreation yesterday? What was done by the members of the class? (Brief analysis.)
15. What is your favorite outdoor sport? Make a list of outdoor sports that are particularly enjoyed by the members of your class. What are the health values of each?
16. How many of these sports can be pursued in the community where you live?
17. Which of these sports are you likely to enjoy and be able to pursue after you go to work?
18. Why would you wish to continue some forms of outdoor recreation after you go to work?
19. What are some of the kinds of indoor recreation that you enjoy?
20. Is indoor recreation a substitute for outdoor play? Discuss the particular advantages of outdoor play in relation to physical and mental health.

III. Suggested Activities and Questions:

1. Students may keep records of their recreation and exercise for two weeks and compute the amount of time they have spent in vigorous exercise outdoors.
2. Students may budget their time and discuss together the ways in which they can find time for the desired amount of outdoor activities.

3. The class may develop a complete list of outdoor activities that are enjoyed by members of the group and chart them on a seasonal basis. Figures may be added to show how many students enjoy participation in each of the activities listed.

4. The class may compile a record of places that are attractive for hiking and that are reasonably accessible.

5. Students may develop a complete list of recreation facilities provided in their city. They may also develop a list of additional facilities which they consider desirable.

Pupil References:

BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit 7, Rand, McNally & Co., 1935.

CHARTERS, SMILEY & STRANG: *The Body's Needs*, pp. 169-192, Macmillan Co., 1935.

TURNER & COLLINS: *Community Health*, Chap. XIV, D. C. Heath & Co., 1935.

WINSLOW & HAHN: *The Healthy Community*, Chap. XII, Charles E. Merrill Co., 1934.

Teacher References:

NEWMAYER: *Leisure and Recreation*. A. S. Barnes & Co., 1936.

PANGBORN: *Adventures in Recreation*. A. S. Barnes & Co., 1936.

WILLIAMS & BROWNELL: *The Administration of Health and Physical Education*. W. B. Saunders Co., 1934.

Bulletins:

Issued by the National Recreation Association, 315 Fourth Avenue, New York City.

Park Departments in large cities.

UNIT XV

SCHOOL HEALTH

Time: 2 or 3 lessons

I. Objectives:

1. To appreciate the value of attention to health during childhood.
2. To recognize that health is a problem of school life.
3. To know some of the important ways in which schools help boys and girls to secure and maintain health.
4. To appreciate and make use of the various health services given through the school.
5. To accept personal responsibility for maintaining one's own health and for cooperating in the school health program.
6. To show the tie-up between school health and general health.

II. Suggested Teaching Plan:

1. Why are schools provided for children?
2. How does school help to make life pleasant for you?
3. In what ways do you expect your school days to help in making the future more pleasant and successful?
4. Does it pay, on the average, for boys and girls to continue in school as long as possible? (Give examples.)

5. Why is attention to the health of pupils properly a part of education in public schools?

6. What items in schoolhouse construction are related to health?

7. How is the work of the school custodian related to your health?

8. Discuss the responsibilities of pupils in maintaining a sanitary school building.

9. What conditions in your classroom are related to health? (Ventilation, lighting, seating.)

What part do you have in cooperating to secure favorable health conditions in the classroom?

10. How does the community protect pupils against the spread of communicable diseases in schools? (Examination and supervision by school doctor and nurse.)

11. Does your school provide opportunity for immunization against diphtheria and vaccination against smallpox? How many students have been immunized and vaccinated?

12. How do physical examinations help students to keep well?

13. Does your school provide regular physical examinations? How often?

14. What are some of the physical defects that are commonly found in examination of school children? (See school records.)

15. Have you had all your reported defects corrected?

16. How does the school nurse help in securing the correction of physical defects?

17. Discuss the relation of weighing and measuring to the health of school children. Are you weighed and measured regularly? Do you know how much you have grown in height and in weight during the past year? How does this compare with the growth of other boys and girls of your age?

18. What are the health values of morning inspection in school? Of relaxation periods and recesses?

19. Does your school provide opportunity for vigorous physical exercises? Is a good physical education program worth while? Why? (Contributes to health, sportsmanship, skill and enjoyment of leisure.)

20. Discuss the reasons why health teaching and the development of good health habits are important in the school health program.

21. How have you personally benefited by health activities carried on in school? Let different students contribute their experiences.

22. As a citizen would you consider it worth while for your city to spend money for health work in schools? Why?

III. Suggested Activities and Questions:

1. How much money does the community spend annually on schools, and how much is spent directly for school health?

2. Discuss the various agencies in the school (such as the student council, school newspaper and assembly periods) by which students can promote interest in health. Under the guidance of teacher (or principal) they may plan a program of action.

3. Persons in charge of various phases of school health work (school physician, school nurse, director of health education) may be asked to speak to the class about the health services rendered by their departments.

4. Students may place in their notebooks a complete list of health activities provided in their school. This list may well be developed under three main headings:

(1) Health protection

(2) Correction of defects

(3) Promotion of vigorous health.

5. In rural schools, students may discuss the particular health problems of their own situation, and plan ways of bettering conditions or of making better use of the facilities present.

Pupil References:

- ADDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit X, Ginn & Co., 1939.
- BROWNELL, IRELAND & TOWNE: *Science of Living*, Unit VII, Rand, McNally & Co., 1932.
- GREGG & ROWELL: *Health Studies*, Part II, Chap. XII. World Book Co., 1936.
- TURNER & COLLINS: *Community Health*. Chap. XV, D. C. Heath & Co., 1935.
- WINSLOW & HAHN: *The New Healthy Living*, Book II, Chap. XXIV, Charles E. Merrill, 1935.

Teacher References:

- PRESCOTT & HORWOOD: *Sedgwick's Principles of Sanitary Science*, pp. 521, 522, 526, 528, 592. Macmillan Co., 1935.
- SMILEY & GOULD: *Community Hygiene*, Chap. 18, Macmillan Co., 1934. Revised edition.
- TURNER: *Personal and Community Health*, Chap. XXXI, D. C. Heath & Co., 1939.

UNIT XVI

THE HEALTH OF THE WORKER

Time: 4 or 5 lessons

I. Objectives:

1. To appreciate the importance of considering health, tastes, and abilities in selecting an occupation.
2. To appreciate that health plays an important part in an adult's ability to do effective work.
3. To understand that it is desirable for the worker to plan a schedule of living outside of working hours that will help to keep him fit.
4. To know some of the common causes of fatigue in work, and how undue fatigue may be avoided.
5. To learn of certain industrial health hazards and their preventives.
6. To recognize the dangers in factory work for young boys and girls.
7. To become acquainted with some of the ways in which industries and governmental agencies safeguard the health of workers.

II. Suggested Teaching Plan:

1. What kind of work would you like to do when you finish school? Why do you think you would like this work? (Why is it desirable to choose work that is suited to one's interests and abilities?)
2. Name the kinds of work you know about. What health problems are involved?
3. What are the chief occupations in your community? What are the health problems associated with them? Can they be improved?
4. What kinds of working conditions are beyond the control of the worker? (Sanitation, ventilation, safe working conditions.)
5. Is there any relation between a man's care of his health and the quality of work he can do? What are some of the health needs of the person who does sedentary work? Of the person who does vigorous physical work?
6. What is meant by "fatigue" in work? Discuss the difference between "normal fatigue" and "cumulative fatigue."

7. What are some of the chief causes of "fatigue" in industry? (Rapid work, long hours, cramped position, monotony.)

8. What dangers arise from fatigue in work? (Accidents, organic disease, less work done, less well.)

9. What are some of the ways in which industries help to reduce fatigue? (Shorter hours, better lighting and ventilation, rest periods.)

10. What are some of the occupations that involve serious health dangers? (Lead trades, carbon monoxide in garages, and stone cutting.)

11. What are some of the ways in which employers provide healthful conditions for work and promote the health of their employees? (Hygienic surroundings, mechanical protection against accidents, safety education of employees.)

12. Discuss the reasons why an employer can afford to spend money for promoting the health of his employees.

13. In what ways does our government protect the health of the worker? (Factory inspection, advice to industry in health problems, required accident insurance, laws governing the conditions of employment.)

14. At what age and under what conditions are boys and girls allowed to go to work in Massachusetts? How do you get a working certificate? Why is a physical examination required? (Secure bulletin giving state regulations from State Department of Labor and Industries.)

III. Suggested Activities and Questions:

1. The class or groups of students or individuals may visit an industrial plant in the community and discuss in class the kinds of work they have seen and the health problems involved.

2. If some local industrial plant has a good health service program, a representative from its welfare department may be asked to talk to the class about the work.

3. Students may list in their notebooks the most common occupations in their community, together with lists of healthful and unhealthful conditions involved in each.

4. The class may secure from the State Department of Labor and Industries a copy of the rules and regulations governing factory sanitation and the health of workers, and child labor laws. This may be used for study and discussion in class. Note whether or not such rules and regulations are enforced.

5. Students may develop in class a plan for daily routine of healthful living (including diet) for a few common types of occupations such as office work, factory machine work which involves standing all day, sales work in stores, and labor on a construction job.

Pupil References:

- ANDRESS, GOLDBERGER & HALLOCK: *The Healthy Home and Community*, Unit IX, Ginn & Co., 1939.
- BIGELOW & BROADHURST: *Health in Home and Neighborhood*, Chap. VIII, Silver, Burdett & Co., 1930.
- BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit VI, Rand, McNally & Co., 1935.
- TURNER & COLLINS: *Community Health*, Chap. VII, D. C. Heath & Co., 1935.
- WINSLOW & HAHN: *The New Healthy Living*, Book II, Chap. XXV, Charles E. Merrill Co., 1935.

Teacher References:

- SMILEY & GOULD: *Community Hygiene*, Chap. XII, Macmillan Co., 1935. Revised edition.
 TURNER: *Personal and Community Health*, Chap. XXXII, C. V. Mosby Co., 1939.
 WILLIAMS & OBERTEUFFER: *Industrial Hygiene*, Chaps. VIII, XI, XII, McGraw-Hill Book Co., 1930.
 CAPLIN & OCEAN: *Vocational Hygiene*, Globe Book Co., 1938.

UNIT XVII

COMMUNITY ASPECT OF SAFETY*

Time: 4 or 5 lessons

I. Objectives:

1. To appreciate the cost of accidents to the community and the importance of safety as a community problem.
2. To know the chief causes of accidents.
3. To realize that the use of alcohol increases the chance of accidents.
4. To know some of the common causes of accidents in the home and how they may be avoided.
5. To become acquainted with the cost of fire to the community, to know some of the common causes of fires, to realize the importance of fire protection, and to know some common safety practices for fire prevention.
6. To accept personal responsibility for one's own safety practices and to cooperate with others in trying to prevent accidents.

II. Suggested Teaching Plan:

1. How do the safety problems of boys and girls today compare with those of boys and girls in pioneer days?
2. How do safety problems of the country compare with those of the city?
3. Secure from your reference books some figures on the numbers of fatal accidents in this country and discuss them in class.
4. Is safety a health problem? Why?
5. Secure figures to show the cost of accidents and discuss them in class.
6. Is safety a community problem? Why?
7. What is the greatest single cause of accidents at the present time? (Automobiles.)
8. Discuss the different kinds of automobile accidents, and develop a list of the chief causes of such accidents.
9. What are some of the activities carried on by the community, city and state to prevent automobile accidents?
10. From class discussion make a list of rules for safe driving.
11. Develop a list of rules for pedestrians.
12. What does your school do to avoid street accidents? What is your part in this safety program?
13. Discuss the cost of fire to individuals and to the community.
14. How do your community agencies prevent fires?
15. What are some of the common causes of fires and how can they be avoided?

* Various aspects of the safety education program will be taught elsewhere.

16. What are some of the ways in which accidents happen from falling?
17. What does the community do to prevent falls in the street and in public buildings?
18. Make a list of the ways in which falls at home can be avoided.
19. Make a list of the type of accidents with which you are acquainted, discuss their causes and decide upon ways of avoiding them.
20. Is there a division of safety in your city? What are some of its activities?
21. What private organizations in your community work for safety? What do they do?
22. To what extent are you responsible for your own safety and for the safety of others?
23. Is a person ever justified in risking his life? If so, under what kinds of circumstances?
24. What do you think is meant by the expression, "Choose your adventure"?

III. Suggested Activities and Questions:

1. A Safety Council may be developed in the class (or in the school). Under the leadership of the teacher (or principal), it may make a study of the safety needs in and about the buildings and plan a program for promoting safety practices.
2. A representative of the local department of safety or of some private organization working for community safety may speak to the class on safety problems.
3. Committee from the class may visit the local Police Department and Fire Department to learn what these departments are doing for safety and to find out how the boys and girls of the city can better cooperate in the safety program.
4. Four-minute speeches may be prepared on various aspects of safety and given in different rooms throughout the building.
5. Students may keep records of ways in which they help to promote safety among younger children. Such records may be read in class and discussed.
6. Students may visit factories in the community to learn about their safety programs and report to the class.
7. Students may secure figures for accidents in their own city, town or state during the past four or five years and discuss them in class.
8. Objective tests in safety may be secured from the National Bureau of Casualty and Surety Underwriters, New York City.
9. A safety play may be given as an auditorium program. (Plays appropriate to junior high school use can be secured from the National Safety Council, 1 Park Avenue, New York City.)
10. Material for supplementary reading or study may be secured from the Massachusetts Safety Council, 80 Federal Street, Boston, Massachusetts.
11. Safety posters may be made by pupils and used throughout the school buildings.
12. Visual aids, supplementary reading material, suggestions for assembly programs, lesson plans, courses of study, and the services of the Supervisor of Safety Education may be obtained from the Department of Education, 200 Newbury Street, Boston, Massachusetts.
13. Slogans may be adopted for prevention of accidents.

Pupil References:

- ADDRESS & BROWN: *Science and the Way to Health*, Chap. XXI, Ginn & Co., 1929.
- BROWNELL, IRELAND & TOWNE: *Progress in Living*, Unit 6, Rand, McNally & Co., 1935.
- CHARTERS, SMILEY & STRANG: *Health through Science*, pp. 123-138, Macmillan Co., 1935.
- GREGG & ROWELL: *Health Studies—Home and Community*, World Book Co., 1936.
- TURNER & COLLINS: *Community Health*, Chap. XIII, D. C. Heath & Co., 1935.
- WINSLOW & HAHN: *The Healthy Community*, Chap. XII, Charles E. Merrill Co., 1932. Revised edition.
- WOOD, PHELAN, LERRIGO, LAMKIN & RICE: *Blazing the Trail*, Chap. XII, Thomas Nelson & Sons, N. Y., 1936.

Teacher References:

- Safety Education in the Secondary Schools*—Herbert J. Stack. National Bureau of Casualty & Surety Underwriters, 1 Park Avenue, New York City.
- Safety Bulletins from State Department of Education, 200 Newbury St., Boston.
- TURNER: *Personal and Community Health*, Chap. XXXII, D. C. Heath & Co., 1939.
- How to Promote Community Safety?* Published by the Safety Department of the Welfare Division, Metropolitan Life Insurance Co., New York.

Films:

- Learn and Live*—loaned by Boston University, School of Education, Film Service, and U. S. Bureau of Mines, 4800 Forbes St., Pittsburgh, Pa.
- Carbon Monoxide*—loaned by Boston University, School of Education, Film Service.
- Safety at Sea*
- Street Safety*
- Fire Protection*—for sale by Eastman Teaching Films, Rochester, N. Y.
- Fire Safety*

The Commonwealth of Massachusetts

SUGGESTED TEACHING UNITS IN PHYSIOLOGY AS APPLIED TO DAILY LIVING FOR THE JUNIOR HIGH SCHOOL

MASSACHUSETTS COURSE OF STUDY IN HEALTH EDUCATION

Bulletin No. 3 ✓
1940



ISSUED JOINTLY BY
MASSACHUSETTS DEPARTMENT OF EDUCATION
AND
MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
BOSTON, MASSACHUSETTS

FOREWORD

A committee has been organized for some years for the purpose of establishing outlines in health. This committee was originally sponsored in the Massachusetts Department of Education in 1932 by Frank Purinton Morse, then Supervisor of Secondary Education.

A mimeographed report was issued for purposes of trial in certain interested school systems. About three years ago, it was definitely decided that the immediate task was to establish these outlines for the use of grades seven, eight and nine, and to defer the preparation of outlines for the upper grades to a later date.

A second report was mimeographed and used for experimental purposes in certain schools in 1936-37.

The following bulletin is one of five which has been prepared by the committee. The Massachusetts Department of Education is pleased to cooperate with the Massachusetts Department of Public Health in the issuance of these bulletins. I wish to thank all concerned, and particularly the committee whose names are herein listed, who have made the work possible.

WALTER F. DOWNEY,
Commissioner of Education.

The Massachusetts Department of Public Health, realizing that the school health education program is an integral part of preventive medicine and the public health program, is especially pleased to cooperate with the Massachusetts Department of Education in the publication of a guide for the teaching of health in the junior high school. It is the duty of the public health profession to inform the educational profession as to the thoughts and actions which they wish the citizens of the community to have regarding their health. The cooperation of the public health profession with the teaching profession is indeed a powerful alliance and one which is going to make it possible to bring closer to realization our goal, a people free of preventable illness and defects.

PAUL J. JAKMAUH, M. D.
Commissioner of Public Health.

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INTRODUCTORY NOTE TO TEACHERS

The Committee on Health Education in the Secondary Schools was appointed by the Department of Education. This Committee set up the general plan. Individual members prepared teaching units on the respective topics. These units were revised upon the basis of suggestions from other members of the Committee. The revised units were mimeographed and placed in the hands of a limited number of junior high school teachers whose suggestions and criticisms were considered in making the later revision.

For the purpose of still more effectively adapting the material to the age levels for which it was prepared, subcommittees of junior high school teachers and administrators examined and further revised various units which were then turned over to a small editing committee.

The work of the committees represents a voluntary time contribution on the part of committee members who were already carrying a full schedule of professional work. This fact and the experimental use of the present units explains why the units themselves have not all been put into similar form. The teacher is referred to the separate bulletin on "Suggestions to School Administrators for Health Teaching in Junior High Schools" for a consideration of the general plan.

The units are planned to follow an adequate program of health instruction in the elementary schools. This program of study proposes the teaching of Community Health in Grade VII; Physiology as Applied to Daily Living in Grade VIII; also Physiology as Applied to Daily Living for the first half of the school year for Grade IX. The Committee suggests that possibly in Grade VIII, Unit I—Unit XI be taught; and that in Grade IX, Unit XII—Unit XVII be developed for the first half year. It proposes the teaching of Home Nursing and Child Care for Girls and First Aid for Boys in the last half of the ninth year. Both teacher and pupil references are included in connection with the units to be taught.

This is a tentative outline for a later revision of which your suggestions are desired concerning grade placement, interest, other possible experiments, activities, demonstrations, references, and visual material.

The units are planned on the assumption that two periods a week throughout the school year are available for health instruction. If your time allotment does not allow you to complete all the units, it is recommended that you teach adequately the most important ones and omit the others.

This outline presupposes the program of instruction prescribed for the first six grades in the Course of Study in Health Education for the Elementary Grades, published in 1931 by the State Department of Education. If your pupils have not had this training, you will need to take that fact into consideration.

The units present, in brief and simple form, the more important facts concerning the vital processes of the human body as they are related to health. Health problems are raised which will stimulate a desire for a knowledge of physiological facts. Standard texts will furnish the basic information, and the teacher will adapt and enrich the units which he uses to the end that our combined experience may improve the grade placement and practical value of the material.

In addition to your program of direct health instruction, it is hoped that you will contribute to the broad program of health education which includes healthful school living and school health services.

Alcohol, narcotics and safety are treated in separate outlines issued by the State Department of Education. A separate unit of work on tuberculosis is available from the Massachusetts Tuberculosis League, 1148 Little Building, Boston. A unit of work on the Nature of Bacteria is available from the Metropolitan Life Insurance Company, 1 Madison Avenue, New York City.

REFERENCES FOR USE WITH UNITS ON PHYSIOLOGY AS APPLIED TO DAILY LIVING

Pupil References:

- ANDRESS & BROWN. *Science and the Way to Health*. Ginn. 1929.
 ANDRESS & BROWN. *Experiments in Health*. Ginn. 1929.
 BROWNELL, IRELAND & TOWNE. *Science in Living*. Rand-McNally. 1935.
 BURKHARD, CHAMBERS & MARONEY. *Personal and Public Health*. Lyons & Carnahan. 1936.
 CHARTERS, SMILEY & STRANG. *Health Knowledge*. Macmillan. 1935.
 CHARTERS, SMILEY & STRANG. *Health Through Science*. Macmillan. 1935.
 COCKFAIR & COCKFAIR. *Health and Achievement*. Ginn. 1936.
 GREGG & ROWELL. *Health Studies*. World Bk. Co. 1936.
 THACKSTON & THACKSTON. *Human Health*. Holt. 1931.
 TURNER. *Physiology and Health*. Heath. 1935.
 WHEAT & FITZPATRICK. *Everyday Problems in Health*. Am. Bk. Co. 1933.
 WILLIAMS & DANSDILL. *Health and Ideals*. Benj. H. Sanborn & Co. 1936.
 WINSLOW & HAHN. *New Healthy Living*. Merrill. 1935.
 WOOD, PHELAN, LERRIGO, LAMKIN & RICE. *How We Live*. Nelson. 1936.

Teacher References:

- BURTON-OPITZ. *An Elementary Manual of Physiology*. Saunders. 1936.
 CONRAD & MEISTER. *Teaching Procedures in Health Education*. Saunders. 1938.
 CHENOWETH & SELKIRK. *School Health Problems*. Crofts. 1937.
 HAGGARD. *Man and His Body*. Harper. 1938.
 HUSSEY. *Teaching for Health*. New York University Bookstore. 1938.
 RYAN. *Mental Health Through Education*. Commonwealth Fund. 1938.
 STILES. *Human Physiology*. Saunders. 7th edition. 1936.
 TURNER. *Principles of Health Education*. Heath. 1939.
 TURNER. *Personal Hygiene*. Mosby. 1937.
 WILLIAMS. *Anatomy and Physiology*. Saunders. 5th edition. 1935.
 WILLIAMS. *Healthful Living*. Macmillan. 2nd edition. 1934.
 WILLIAMS & SHAW. *Methods and Materials of Health Education*. Nelson. 1935.

Films:

- | | | |
|-----------|-------------------------------|---|
| UNIT II | <i>The Body Framework</i> | } Eastman Classroom Teaching Films,
Rochester, N.Y. |
| | <i>The Living Cell</i> | |
| UNIT IV | <i>Muscles</i> | |
| | <i>Posture</i> | |
| | <i>Feet</i> | |
| UNIT V | <i>Food and Growth</i> | } Eastman Classroom Teaching Films,
Rochester, N.Y. |
| UNIT VI | <i>Digestion</i> | |
| UNIT VII | <i>How Teeth Grow</i> | |
| | <i>Care of the Teeth</i> | |
| UNIT VIII | <i>Circulation</i> | |
| | <i>Blood</i> | } Bray Picture Corp., 729 Seventh Ave.,
New York, N.Y. |
| | <i>Action of the Human</i> | |
| | <i>Heart and How It Works</i> | |
| | <i>Microscopic View of</i> | } Scientific Film Co.,
Daytona Beach, Fla. |
| | <i>Blood Circulation</i> | |

UNIT IX	<i>Breathing</i>	}	Eastman Classroom Teaching Films, Rochester, N.Y.
UNIT X	<i>Skin</i>		Massachusetts Tuberculosis League, 1148 Little Building, Boston.
UNIT XI	<i>Behind the Shadows</i> <i>Working for Dear</i> <i>Life</i>	}	Metropolitan Life Insurance Co., 1 Madison Ave. New York, N.Y.

UNIT I

HOW WE GROW

*(Two to four periods.)***Objectives:**

1. To maintain interest in "growing."
2. To understand that "growth" means more than increase in size; that it develops better use of the body, and of the mind.
3. To appreciate that habits of living affect one's growth and development.
4. To develop a desire to "grow up" normally and to the finest degree possible.

Possible Approach:

Oral questions for discussion, or for pretest of knowledge of science which forms background for this unit:

1. Do all things grow? (No, only living things.)
2. What are the differences between living and nonliving things? (Living things can grow, move, use food, breathe, feel and reproduce their kind.)

Problem I

What can we find out about growth of living things? Do all grow the same way?

Activities

Examine a young tree to see if you can see where the new growth is found, or look at a cross section of a tree trunk or a tree stump to observe the rings of growth.

Examine clam shells to see rings of growth.

Describe what has been learned by watching dogs, cats or chickens growing.

Content

Trees grow most rapidly in the spring when new growth is added to the ends of branches and the thickness of the trunk and branches is increased by a ring or new growth just under the bark.

Clam shells grow by addition of more material to the outer edge of the shell.

These animals seem to grow "all over."

Growth of all living things is alike in one respect. It comes from within, and is never just an addition to an outside surface.

Problem II

What is happening to growing things while they are increasing in size?

Activities

Describe some of the things you have noticed that kittens, puppies, or perhaps baby brother or sister can do as they grow larger.

Consider the advantages of man having a long period (18 to 20 years) for growing.

Content

Animals and children are quite helpless at birth. Then they gradually are able to move about, to play and later to get their own food, or feed themselves. Gradually they depend less and less on some one to care for them. Children grow in knowledge as well as in size.

Problem III

What things are necessary for growing?

Activities

Make a list of the things that young, rapidly growing plants seem to need, that animals need, and that children need.

Content

Plants need water, food (from soil after food in seed is used up), warmth, sunshine, protection from injury.

Some animals, and all children need rest and sleep in addition to things needed by plants.

Children need care and protection from diseases which are common to them.

Problem IV

Since most boys and girls are anxious to be "grown up," what are some ways to try to be "grown up"?

Activities

Class may suggest ways of acting which are "grown up" such as keeping one's temper, being more responsible, courteous, and not "showing off," avoiding being noisy.

Individuals may weigh and measure themselves and start keeping a record for the year. (Measuring twice or four times a year, and weighing every month, is suggested.)

Discuss habits which help one to appear "grown up," including good posture to make one taller, correct clothing for one's age and size, and cleanliness.

If measures of strength, lung capacity or athletic accomplishment are available, the improvement of these records from time to time may be used as evidences of growth and development.

Content

"Growing up" includes developing of the mind, and changing of habits and action. One begins to think more about himself in relation to other people with whom he lives every day, and in relation to the community.

Weighing and measuring is only for the purpose of interesting boys and girls in their individual growth, and not for comparison with any table of average heights and weights to determine "under" or "over" weight.

Good posture adds to height, and makes tall people admired.

UNIT II

HOW THE BODY IS BUILT

(Two to four periods)

Objectives:

1. To learn that the body is made up of a framework and many different parts which work together.
2. To learn that the body has structures which enable it to use food, to move, breathe, feel pain or pleasure.
3. To learn that the unit of structure (the cell) is the same in all parts of the body.
4. To appreciate that the human body is the most wonderful mechanism known.

Possible Approach:

Class may make a list of a number of things which the human body can do, and decide which of these can be done by other living things, and which can be done only by man. (For example, walk, eat, breathe, sleep, talk, read, grow food, make clothing, build houses, machines or roads, cure diseases, write books, paint pictures.)

Problem I

How is the human body able to do so many things which cannot be done by other living things?

Activities

Class may select a few things which can be done only by humans from the list previously made, and try to decide which parts of the body are used most in doing these things, for example, talking, or painting a picture.

Content

Most of the things done by humans are results of several parts of the body working together. In drawing a picture, the eye, brain, and hand are used. In fact most of the work of humans is accomplished by these three parts of the body working together. The brain and the hand of man are superior to those of any other living thing.

Problem II

How are the parts of the body arranged to work together?

Activities

Find out what is meant when we say "part of the body." (Use texts.) Class may make a list of all the parts (organs) of the body which they already know, and name the special work of these organs as far as they can. (This should be done only to check present knowledge, not to learn new names and functions and without reference to texts.)

Study in outline the framework of the body to learn what gives the body its general shape, what holds it together and allows different parts to be moved by muscles.

Make lists of groups of organs which seem to work toward the same end. For example, digestion (mouth, throat, stomach, intestines). Learn that these groups of organs are called systems. (All the names of systems need not be learned here, since they will be learned better later, when studied in separate units.)

Use films*, textbook illustrations, pictures or charts to get a general idea of body structure or arrangement, but do not study detailed structure.

Content

A part of the body may be properly called an organ. Organs have special work to do, as eyes to see, stomach to digest food.

List will probably include eyes, ears, nose, mouth, throat, stomach, intestines, heart, lungs, kidneys.

Conclusion may be that there are many parts of the body about which class wants to learn more.

The body is made up of the head, trunk, arms and legs. The head and trunk contain the organs of the body, which are protected by bone structures. The arms and legs are arranged to allow free movement by having many joints.

A system is a group of organs having a special work to do.

The work of an organ or of a system is also called a function.

The organs in one system work together, and with other systems, in fine harmony.

When we stop to think about our bodies, we are amazed at how much is going on within them, without our being aware of it.

*The first part of the film, "The Body Framework," may be used for appreciation, if it is available.

Problem III

Of what are the parts (organs) of the body made?

Activities

Use a magnifying glass (reading) to look at the skin, and see how different it looks. Would it be possible to see what the skin is made of if one could magnify it more?

Learn about the invention of the microscope. If class is not already acquainted with a microscope, describe how it works, and demonstrate adjustment of mirror and lens.

Secure a prepared slide of the epidermis of skin, or prepare a slide of scraping of lining of mouth and saliva, to show what cells look like.

Examine a very thin slice of onion skin, to see the cell structure. Notice how closely the cells fit together, like the bricks in a house.

Make drawings of cells, to be kept in notebooks.

Question what other differences there may be in parts of the body beside the shape of cells revealed by the microscope.

Consider the smoothness and hardness of the nails, and bones compared to the skin, the color of the blood vessels in the hand, the hardness of the head, the firm but not hard muscles of the arm.

Class may suggest all the scientific ways they have heard of which help us to know more about the structure of the human body, and how it works.

Content

One of the best ways to learn what anything is made of is to see it magnified, since the human eye is not capable of seeing very small things without aid.

The microscope was invented by a Dutchman (van Leeuwenhoek) (1632-1723) who discovered many things that had never been seen before, including bacteria.

The microscope is a series of magnifying glasses (lenses) at each end of a dark tube.

On looking at a bit of the skin under the microscope, small irregular shaped blocks are seen. These are known as cells. A cell is the smallest unit or part of the living body.

All living things are made of cells, each kind of plant or animal having cells unlike those of others.

Since the appearance—color, texture—of the human skin differs from that of the onion, they must be made of different substances. Likewise, the skin, nails and blood vessels must be made of different kinds of substances. These substances are known as chemical compounds. Some of these compounds in the bones are minerals similar to those in the clam shells. We learn the exact nature of these chemicals by analysis (taking them apart) in the laboratory.

The X-ray, surgery, experiments of many kinds—on eating, exercise, changing of temperature outside body, etc., are being used. Our knowledge of the body functions has increased greatly in the past few years with development of scientific methods. There is much remaining to be learned, which will help us to know how to live better, and to enjoy the wonderful bodies we possess.

UNIT III

THE HUMAN BODY AND ITS USE OF OXYGEN

(Two to four periods.)

Objectives:

1. To show how oxidation furnishes power and heat.
2. To show why oxygen is needed by the human machine.

Possible Approach:

Oral questions for discussion, or for review of the knowledge of science

which forms background for this unit.

1. How does a coal stove furnish heat? (Burning or oxidation of coal). What is the effect of opening the drafts? Why? What is the effect of closing the drafts? Why?
2. In a locomotive what is the source of the power that pulls the train? What process enables a motor car to run? (Oxidation of fuel.) What unites with the fuel? (Oxygen of the air.)
3. What is the most effective way to put out a fire? Why? (Smother fire with water, blankets, or something else to keep oxygen away from it.) What is the source of power and of heat? (Oxidation.)

Suggested Problems:

Problem I — What Is Oxidation?

1. Study of a burning candle.

Lower a lighted candle into a jar. This may be done by fastening a wire to the candle. The jar can be partly covered by a glass plate. What happens to the flame? Why? Pour some limewater into the jar. What change is noted? (If the class has not had the test for carbon dioxide, explain that the only substance which will turn limewater milky is carbon dioxide.) Hold a piece of cold glass above a burning candle. Look for drops of water on the glass. What substances are produced by a burning candle?

2. Oxidation in an automobile.

Discuss the union of oxygen with fuel in an automobile. Where does this union take place? What waste products are given off? Is heat as well as energy produced?

3. Summary of facts discussed.

What is oxidation?

What are the results of oxidation?

What are the waste products of oxidation?

Of what importance is oxidation? (Source of power and movement in both living and nonliving world.)

Problem II — How Is Oxidation Carried on in the Body?

1. Experiments to show the products of oxidation in the human machine

- a. Breath through a straw into a dish containing limewater. What change is noted? What is given off by the body?
- b. Breath on a cold window or a cold piece of glass. Explain the results. (Water in breath.)
- c. Breathe on the bulb of a thermometer. What change is seen in the reading of the thermometer? (Warmed by heat given off in the breath.) What substances are given off by the human machine during breathing? (Water, carbon dioxide.) How do they compare with the products given off by the burning candle? What process goes on in the human machine? (Oxidation.)

2. Oxidation in the human body.

Why is oxidation necessary in the human body? (Produces heat and movement.)

How warm is the body? (98.6 degrees Fahrenheit.)

Is the temperature of the human body constant or variable? (Constant.)

What part of the body is adapted for taking in air? (Lungs.)

What substance in the air is needed by the body? (Oxygen.)

What does the body use for fuel? (Digested food.)

How are food and oxygen carried from one part of the body to another? (Blood.)

What effect does increased exercise have on the amount of food and oxygen needed by the body? (Increases amount needed.)
 What waste products are formed during oxidation? (Water, carbon dioxide.)

Supplementary Activities and Questions for Discussion:

1. Why is oxygen essential for all living things? (Oxidation is always going on in living things.)
2. Do plants as well as animals have to have oxygen? (Yes.)
3. How do animals that live in the water secure a supply of oxygen? (From oxygen dissolved in water.)
4. Is it sufficient to get air into the lungs? (No, it must be taken up and distributed by blood.)
5. What proportion of the air is oxygen? (21%.)
6. What is the chemical test for oxygen? (Use this if class has had the test in General Science.)

UNIT IV — HOW THE BODY MOVES. THE BODY IN ACTION AND AT REST.

(Four to eight periods.)

Objectives:

1. To learn something of how the body moves.
2. To learn how the muscles and bones cooperate.
3. To appreciate how the great variety of muscles makes it possible for the body to carry on its different functions.
4. To appreciate the necessity for both activity and rest.

Possible Approach:

Oral questions for discussion or for review of the knowledge which forms background for the unit.

1. Why we need muscles. Discuss the things you do from the time you get up until you go to bed. How do muscles help you to do these things?
2. The pupils may list their favorite sports, discussing them in order to discover which muscles are chiefly used in each sport. The class may discuss the way in which the muscles of the body may be compared to a baseball team.
3. Pretest: Allow pupils to write all they can remember regarding muscles as well as questions they wish to have answered. These questions, with others from the teacher, may then be answered orally. The pupils should understand that this test will be used for discussion purposes only, and will not be graded.

Problem I — What Makes the Movements of the Body Possible?

Suggested Activities:

1. What changes go on in your arm when you bend it? Feel your upper arm and find the bone. Feel the bunch of muscle in the center. As you move the arm, notice the muscles move. Compare your arm muscles with those of a boy who has developed his muscles through athletics.
2. Look up in a textbook the meaning of contraction and relaxation. When a muscle contracts and relaxes, what movements can take place? List

these. Example: Lifting, twisting. List some interesting uses of muscles. For example:

1. Whistling.
2. Chewing.
3. Speech.
4. Posture.
3. What advantage is this great variety of movement?
4. With the aid of reference books, find illustrations which show how muscles are attached to bones. Notice the comparative size of groups. Example: Eyes, legs, back, etc.
5. Discuss the way in which muscles are in opposing pairs. (This principle is illustrated by the rudder of a boat.)
6. Secure several pieces of different kinds of lean meat from a butcher for use in the next lesson.

Problem II — What Are the Kinds of Muscles?

Suggested Activities:

1. Consider the following questions:
 1. What are muscle fibres?
 2. What are the three kinds of muscles?
 3. What is the chief difference between the muscles of the stomach and those of the arm?
 4. Of what advantage are the different kinds of muscles to the body?
2. Examine under a magnifying glass the pieces of lean meat (muscle) which were brought in. This will show the fundamental structure of muscles, as there is great similarity between animal and human structure.

This muscular part of the body is the lean part of the flesh. Is this flesh similar to the meat you eat? Are the meats you eat composed of the muscles of animals? State your answers and give reasons for your belief.
3. Discuss the difference between the muscles of the arm and those of the stomach.

This brings out the fact that the first are voluntary, and the second are involuntary. Why is this an advantage? Classify some of the other muscles as voluntary and involuntary. Look up the definitions.
4. With the aid of reference books, learn something about the heart muscle and how it differs from the voluntary and involuntary muscles. (The heart muscle is a special kind of muscle which looks like a voluntary muscle, but acts like an involuntary.)

Problem III — How Do Muscles Get Energy For Their Work?

Suggested Activities:

1. Discuss the following questions:
 1. How do muscles get energy for their work?
 2. How does muscular movement produce heat?
 3. What causes fatigue?
 4. Why is it necessary for athletic teams to train gradually?
2. Compare the movement of muscles to the work of an engine. This will bring out the fact that food eaten and oxygen consumed are sources of energy which is stored by the blood in the muscle cells. When the muscles contract, this *energy* is released through combustion. Just as the burning of coal furnishes *waste* products called ashes, there is a waste left by the combustion in the muscles—this causes fatigue.
3. As a further problem regarding fatigue, discuss the following question:

Why does a different form of activity often rest a tired person? What examples from your own experience can you draw on to illustrate this point?

1. Use of different set of muscles.
2. Circulation of blood increased, which assists in removing fatigue substances.
4. Discuss the following questions:
 1. How does muscular movement produce heat?
 2. Have you ever thought of shivering as a form of muscular movement? Explain.
 3. Why do we shiver when we are cold?
 4. When you go away to camp, why do the counsellors start you off on short hikes, gradually working up to overnight hikes?
 5. Why are you always lame after the first game of tennis at the beginning of the season, or the first swim or basketball practice?
 6. Using the reference books, find out why unusual exercise causes lameness, and what other ways tired muscles affect one.
5. Select several sports and decide which muscles are mainly used in each of these activities.
6. Discuss the following questions:
 1. What effect has running on the heart?
 2. What strengthens the heart?
 3. What may weaken the heart?
 4. What is an "athletic" heart?
 5. What is heart failure?
 6. Are boys' and girls' hearts alike?

Problem IV — What Is "Muscle Tone"?

Suggested Activities:

1. Discuss the meaning of muscle tone.
That the muscles may be always ready for use, they must not be entirely soft and flabby, but should be under a very slight contraction called tone. Compare the muscles of a person who is in good physical condition with a person who is frequently ill.
2. Explain why muscle tone is desirable in the intestines.
A wave-like contraction passes over the intestine from its upper to its lower end. During sleep these movements decrease greatly. They increase after meals when there is food to be moved. Hence, after breakfast these contractions are very strong, and at that time emptying of the bowel is most readily done. By going to the toilet after breakfast regularly, it is easy to train these muscles so that the waste will be eliminated always at that time. This training is very important for health and is one of the essential habits to form.
3. Discuss how muscle tone affects posture and the ability to excel in sports. Discuss the qualifications for securing an aviator's license.
4. Consult reference texts to find out what investigations have been carried on regarding the effect of alcohol and narcotic drugs on the work of the muscles.
5. Review the training rules for athletics in reference to this unit.

Problem V — Why Is It Necessary To Have The Right Amount of Activity and Rest?

Suggested Activities:

1. How many members of the class practice and enjoy some sport? How many practice two? More than two? (Each member of the class may tabulate his present practices and with the aid of the physical education

department and his own group seek during the school year to increase participation in sports.)

2. Each pupil may make a spherical graph which will budget 24 hours of his time.
3. Look up in your physiology textbook the reasons why a greater amount of sleep is necessary for the boy and girl in their 'teens than for a grown person.

UNIT V

WHAT ARE FOOD SUBSTANCES?

(Two to four periods.)

Objectives:

1. To lead pupils to feel a new interest in certain foods by learning something of their chemical composition.
2. To develop additional understanding and appreciation of why it is necessary to eat a variety of food.

Possible Approach:

Oral questions for discussion, or for pretest of knowledge of science which forms background for this unit.

1. How do cells do their work?
2. What can you do to furnish conditions favorable for the body cells? Make a list of the things cells need in order to live and grow (air, oxygen, water, food, getting rid of waste). Compare this with the list of health habits made by the boys and girls for themselves.
3. Of what substances are cells built? Find out how many pupils from their study of science, already know the names of the fourteen essential elements in cells. How many of these elements have you seen? With how many have you experimented? (Burned toast may be used as an example of carbon; hydrogen and oxygen are colorless gases found in the air which we breathe—water being made of these two gases, two parts of hydrogen and one part of oxygen. Nitrogen, another colorless gas found in the air, is taken up by plants from the soil in the form of nitrates.
4. Where are the other of the fourteen elements found? (In the earth, usually in combination with other elements—as food for plants, plants in turn furnishing food for animals and men.)

Suggested Problems:

- I. From what source does man get his food?

Activities

Discuss informally "Why is it necessary to have more than one kind of food?" Review with the class what they already know about foods according to uses.

Look up in general science textbooks the topic, "Plants as sources of food."

Content

The three general purposes of food in the body are as follows: For energy and heat, building and repairing tissue, regulating important functions of the body.

This discussion will bring out the point that although animals and plants are used as sources of our food supply, the green plants are really the food factories of the world. These green plants take nonliving materials from the soil, water and air, and manufacture from them the food which we eat.

II. How may we learn from firsthand experience what food substances give the body fuel and energy?

Activities

The class may observe teacher demonstrations or themselves perform simple experiments, writing up the results in their workbooks.

Find out what elements are found in carbohydrates and fats. Review what elements make up cells.

List foods which are the best sources of carbohydrates. Make a chart and posters illustrating such foods.

Make a chart and posters illustrating the best sources of fats.

III. What group of substances are needed for the growth and repair of body cells?

Activities

Consult science textbooks to find out in what respects proteins are like carbohydrates and in what respects they are different.

What is the value of nitrogen to cell life?

Conduct a teacher demonstration before the class or the pupils themselves may experiment for protein.

Content

It is suggested that because of the teaching value, the following simple tests be conducted before the class by the teacher:*

(a) Carbohydrate is a food substance which supplies the body with energy. There are two kinds, starches and sugars.

Test for starch in food—bring some corn-starch to class, add a drop of iodine to show that iodine turns starch blue. Cut a thin slice of potato. Place it in water and scrape with a knife. Remove the potato slice and boil the scrapings in the water. Test for starch with a few drops of tincture of iodine in the water. A deep blue or purple color indicates the presence of starch.

Test for sugar in food—grind some raisins and add a little water. Allow the solid materials to settle, and then pour off the liquid into a test tube. Add about one cubic centimeter (1 c.c.) of Fehling's solution to the liquid and boil. A yellow-red color indicates the presence of sugar.

(b) Fat is a food substance which also supplies the body with energy.

Test for fats and oils—on a piece of paper, rub the kernel of a nut with the covering removed. Hold the paper to the light. The fat changes the light qualities of the paper.

Carbon, hydrogen.

Emphasize breads, cereals, molasses, beans, bananas and potatoes.

Emphasize butter, cream, bacon, peanuts, cream cheese and lamb chops.

Content

Proteins are like carbohydrates because they contain carbon, hydrogen and oxygen, but in addition proteins have nitrogen.

Nitrogen is essential to the growth and repair of each cell.

Mix a heaping tablespoonful of flour with a little water until you have a ball of dough; then put the ball of dough in a

*For more detailed experiments, see integrated learnings in general science.

Activities

By consulting reference texts, find out what foods contain protein.

Find out how much protein you need each day. How often should meat be eaten?

Make a menu for a dinner which is too low in protein. Make one which is too high in protein.

Make a chart of the foods which are the best sources of protein.

IV. What minerals are important for health and growth?

Activities

Why are the minerals sometimes called "the ash constituents"?

Conduct teacher demonstration or the pupils themselves may experiment as to the minerals found in milk.

Content

piece of cheesecloth and squeeze it in a cup of water. In the cheesecloth bag you will find a tough, grayish substance. This is protein.

Both meat and milk contain protein. There is proof that milk and whole wheat supply all the building material needed. Experiments with rat families showed that for more than thirty generations these animals grow and keep well on a diet of one-sixth dried whole milk and five-sixths ground whole wheat with table salt and pure water. They had no other foods. But when the percentage of milk is increased, the animals live longer, do not show signs of old age so soon, and are healthier than the families on the smaller amount of milk. It seems quite clear that food has much the same effect on human beings that it has on animals in the laboratory. The proteins of the cereal grains are most useful in building body cells when they are eaten with a generous amount of milk proteins.

Boys and girls ten to thirteen years old should have about sixty to ninety grams of protein daily. One quart of milk, five slices of bread, a serving of cereal, one egg, and a small piece of meat or fish together with the usual amount of fruit and vegetables, would furnish enough protein.

Emphasize not only meat and milk but fish, eggs, cheese and beans.

Content

Because when any food is burned completely the minerals remain as ashes.

Get an evaporating dish and weigh it. Write all the weights as soon as you find them. Fill the evaporating dish one-half full of milk. Weigh it again. Boil the milk until all the water has evaporated. Weigh the dry part which is left (the residue). The dry part is all the milk except the water. How much did the milk weigh? How much did the residue weigh? How much water evaporated? What percentage of the milk was water? Put the residue over the fire again. Burn it up. The fat, the sugar, and the protein will go off in smoke. Only the minerals will be left. Weigh the ashes which are left. What percentage of the milk was minerals?

Activities

Find out why growing boys and girls especially need calcium in their diet. Make posters illustrating foods which are especially good for building teeth.

Consult references in order to find out the foods which supply calcium. Make bar graphs illustrating the amount of calcium found in various foods. Make a classroom chart of such foods. Make posters which may stimulate high school pupils to eat more of such foods.

Consult reference texts to find out which foods contain phosphorus.

Find the truth of the old saying, "Iron makes red blood."

List foods containing iron. Make bar graphs illustrating amount of iron found in various foods. Make posters which will encourage pupils to eat such foods.

Find out how many of the class have ever heard of iodine? Why is it that people who live by the sea seldom have goiter? List foods containing iodine.

Make out a grocery order which will give the family foods containing the necessary minerals. Why would you select one loaf of graham bread instead of all white bread?

V. What class of foods have scientists learned much about in recent years?

Activities

How did the knowledge of vitamins come about? Read stories of their discoveries. Observe graphs of the growth of rats with and without the vitamins furnished by milk. What difference did milk make?

Why are these new substances called vitamins?

Study the effects of Vitamin A on animals and people. (Obtain pictures of animals.)

Find out the foods which are the best sources of Vitamin A.

Content

Strong bones and teeth cannot be built without calcium.

Emphasize milk, cheese, carrots, celery, spinach and oranges.

Emphasize milk, green vegetables such as spinach, lettuce, celery, cauliflower and asparagus. Eggs also contain phosphorus, as well as cereals and breads made of whole grains.

Iron is an essential part of the red blood cells. It helps to carry oxygen to them.

The sea is much richer in iodine than most of the soil. Sea food is a good source of iodine.

Content

In answer to this question the class may consult references to learn that through long years of observation of diet in relation to disease, and through controlled animal feeding experiments, scientists have been able to prove the value of vitamins in diet. Experiments have proven that vitamins are essential to promote growth and protect the body from certain diseases.

The first part of the word, *vita*, means life. These mysterious substances found in food were called vitamins because they were proved to be necessary to life.

Vitamin A is necessary for growth and for building a resistance to infectious diseases.

Emphasize butter, cream, whole milk, egg yolks, thin green leaves and fruits.

Activities

Find out what vitamin may prevent or cure a disease called "beri beri." Find out why sailors and people on a diet of white rice often used to have this disease. Find out how rats act if Vitamin B is taken out of their diet.

Consult references to find out which foods contain Vitamin B. Make a food chart and a poster showing the best sources of Vitamin B.

Consult references to find out the value of Vitamin C. What is the effect of Vitamin C on animals?

What disease, common among sailors formerly, is rare today? In addition to milk why are babies fed orange or tomato juices?

Make a chart of foods containing large amounts of Vitamin C.

Why is Vitamin D often called "the sunshine vitamin"? Why is it necessary? Count the number of younger brothers and sisters who are taking cod liver oil. What are its best sources? Make a list of the activities of high school pupils which keep them out-of-doors.

From your study of the various food elements, what food would appear to be the most nearly perfect food? Tabulate all the elements contained in this food.

Make classroom posters which will encourage boys and girls to drink milk every day.

VI. What other food substance is essential?

Activities

Would you have an adequate diet even though you have fuel foods, proteins, minerals and vitamins?

Find out the value of such foods.

Find out the best foods to supply this fibrous substance.

Content

Vitamin B prevents and cures the disease called "beri beri." It is also necessary for growth and for assisting in regulating the body processes. Rats fed Vitamin B are bright-eyed, lively and sleek-coated. If Vitamin B is taken away the rats slow up in their movements—their fur becomes rough and dull—they feel cold and appear nervous.

Emphasize whole grain cereals, and lettuce, milk, orange juice, carrots, cabbage, eggs, bananas, dried peas and beans.

Vitamin C is necessary for growth, and for healthy teeth and gums.

Scurvy.

Emphasize raw fruits and vegetables, especially oranges, lemons and tomatoes.

Vitamin D has some of the same effects as sunlight on the human body. Sunlight produces Vitamin D from a substance in the skin. It is necessary for growth, for the prevention of rickets and for good bone and tooth development. Good sources of it are butter, egg yolk, cod liver oil and other fish oils.

Milk is the most nearly perfect food since it contains proteins, carbohydrates, fat, vitamins and inorganic salts. (It would not supply enough iron for the needs of the body.)

Content

No, the fibrous framework of fruits, vegetables and whole cereals are needed.

They are not digested but they form bulk in the intestine to help the body get rid of waste materials.

Emphasize green leafy vegetables such as cabbage, celery, lettuce and spinach; other vegetables and fruits such as squash, tomatoes, oranges and apples; bread and cereals made from whole grains.

VII. What are other important facts about food?

Activities

Consult reference texts to study tea and coffee.

Make a list of the fruit juices you would order over the soda counter. Discuss the food value of each.

Make up good rules to follow in regard to candy. Bring to class samples of fruit candies. (Send to the Massachusetts Department of Public Health for fruit candy recipes.)

Content

Tea and coffee have no food values (except for sugar and cream). They are too stimulating for high school pupils, keeping people wide awake and too active when they should be resting. They crowd out milk, which is the food of greatest value to growing boys and girls.

Too much candy is harmful. Candy should be eaten only at the end of meals, in small quantities. Only pure candy should be purchased.

Special Activities at Close of Unit:

Make a study of the food taken by the Byrd Expedition to the South Pole ("Dinner Is Served at the South Pole," Ethel M. Smith, reprinted from the Junior Red Cross News, January, 1934.)

Practice assembling combinations of food into adequate meals. Food models may be made or purchased from the University of Chicago Book Shop, Chicago, Illinois. Teachers may write to the Massachusetts Department of Public Health for sample set of printed material and order blank.

List all the food sold in your school cafeteria. From such a list, during classroom periods combine into lunches foods which will be adequate. Discuss in class why some of these combinations are better than others. Grade them A, B, C, D. Check up on the actual practices in the school cafeteria. After this food study, the class may conduct a school assembly on the topic, showing food charts and posters made.

Menu books may be made for home use. Mothers may be asked to allow boys and girls to assist in making grocery orders.

UNIT VI

HOW FOOD IS CHANGED INTO A FORM WHICH THE BODY CAN USE — DIGESTION

(Four to eight periods.)

Objectives:

1. To learn the mechanical and chemical changes which food must undergo before it can be used by the body.
2. To gain a true picture of the organs involved in the work of changing food into a usable form.
3. To learn how to care for the organs of digestion.

Possible Approach:

As the topic of digestion has already been introduced in a limited way in the health education texts for grades five and six, the following *objective test* may serve to review for the pupil facts already learned and also as a stimulus for arousing the need of further information on the topic.

Test — Part I

DIRECTIONS: Read the statement over carefully. If you think it is right, underline the word YES at the end. If you think it is wrong, underline the word NO at the end.

- EXAMPLES:** We should sleep with windows open at night. Yes No
 Sunshine is not good for one. Yes No
1. An increased amount of gastric juice flows when one takes pleasure in eating. Yes No
 2. The oxidation or burning of foods provides the body with heat. Yes No
 3. Each cell in the human body takes in food, throws off waste and reproduces itself. Yes No
 4. All starch and sugar which we eat will be present in the blood at some later time as sugar. Yes No
 5. The process of digestion begins when the food enters the stomach. Yes No
 6. The only reason for cooking food is that it improves the taste. Yes No
 7. When muscles do more work, they require an increased amount of oxygen. Yes No
 8. Water and carbon dioxide gas are the two principal waste products of the body. Yes No
 9. Air which we breathe out is richer in oxygen and poorer in carbon dioxide than when we inhale it. Yes No
 10. The regular use of laxatives is harmful. Yes No

Test — Part II

Select from the following list the best words to fill in each of the blanks in the following sentences. Use all the words, and use each of them only once.

absorbed	digestive	pancreatic
bile	exercise	proteins
blood or lymph	gastric	pylorus
bowel movement	hydrochloric	saliva
chemically	intestinal	starch
chemical	intestine	sugar
chewing	large intestine	waste
constipation	liquid	water

When food is digested, it is put into (1)..... form and changed (2)..... so that it can be used by the body. The (3)..... juices make the (4)..... changes. The substance which begins digestion in the mouth is (5)..... It begins the change of (6)..... to (7)..... (8)..... one's food well helps the digestive juices to reach all parts of the body.

In the stomach, the (9)..... juice begins the digestion of (10)..... The principal part of this juice is (11)..... acid. When the food is ready to leave the stomach, the (12)..... opens and the food enters the upper part of the small (13).....

The pancreas pours into the intestine a digestive juice called the (14)..... juice. The liver pours in (15)..... and the

walls of the intestine make the (16)..... juice. When the food is ready to pass through the walls of the intestine, it is then (17)..... by the (18)..... It is then carried to the parts of the body where it is needed.

In the bowel, or (19)....., a great deal of (20)..... is absorbed. Undigestible (21)..... material is also stored by the bowel temporarily. One should have a (22)..... once a day, at a regular time. Regular (23)..... and bulky foods like green vegetables or fruits help to prevent (24).....

SUGGESTED PROBLEMS:

Problem I

BY WHAT PROCESSES DOES THE BODY MAKE USE OF FOOD?

Suggested Activities:

1. Discuss the ways in which the body may be compared to an efficient factory. Consult reference texts to find out why food must be changed before it can be taken into the cells of the body.

SUGGESTED SUMMARY

1. A mechanical change from a solid to liquid form.
 2. A chemical change—such substances as carbohydrates, proteins and fats must be changed into simpler elements.
 3. The indigestible part of the food which cannot be used must be separated from the nourishing part and eliminated as waste.
2. List the organs of the digestive system. Place on the blackboard an outline of the head and trunk of the body. With the aid of reference books, charts or a film, such as "Digestion,"¹ have the pupils become familiar with the esophagus, stomach, pancreas, liver, small and large intestines, which are placed in the diagram on the blackboard.
Why must the food tube contain muscles in its walls?
 3. How can you demonstrate what changes in food take place in the mouth? How is food changed by the teeth and by the saliva? Demonstrate the chemical action of saliva on starch. (Home experiment.) Chew a dry cracker for a minute or until a change in the taste of the cracker is observed. Notice that when chewing is continued long enough saliva changes starch into sugar. This simple experiment illustrates that digestion begins as soon as food enters the mouth, producing both a chemical and mechanical (by chewing) change. How do teeth aid in this process? Name the different kinds of teeth found in the mouth. Summarize why the chewing of food is important.

Problem II

WHAT IS THE FUNCTION OF THE STOMACH?

Suggested Activities:

1. What is the widest part of the food tube?
2. What two important functions has the stomach in digestion?

¹Eastman Classroom Films, Inc., Rochester, N.Y. The showing of this entire film on "Digestion" will be of great assistance in emphasizing not only the organs involved but in illustrating many of the processes of digestion.

3. Have you ever heard anything about a gland?
4. Show Part II, "The Stomach," of the film, "Digestion." Study the shape and structure of the stomach. How long does the food stay in the stomach? What advantage is this? How do the three layers of muscles make it possible for food to be churned? What is a gland? How is the body a manufacturer of its own juices?
A piece of meat known as tripe, which is the lining of a cow's stomach, may be brought to class. This in many ways resembles the lining of the human stomach. The teacher may provide a hand magnifying glass in order that the class may study the honeycombed surface. Note the small glands which open into the pockets of the lining.
What is the name of the stomach's digestive juice and what is its work? How does this illustrate a chemical change? Consult reference texts in order to find out the effect of fear, rage, and excitement on the secretion of this juice.

Problem III

WHAT IS THE WORK OF THE SMALL INTESTINE?

Suggested Activities:

1. What is the length of the intestines?
Refer to diagrams of the digestive tract to note the many coils and twists in the intestines. To illustrate: it has been said that the length is five or six times the height of an individual. In order to show the length of the intestines, if straightened out, the pupils may measure with a string the length of the tract of the tallest pupil in the class. Consult references in order to find out the value of such a great surface in the intestines. Find out that the small intestine is itself from 20' to 24' long, and that it is called *small* only because it is a *narrow* tube. Show scenes 24-26 of the film, "Digestion."
2. As food passes through the small intestine, what three digestive juices finish the process of digestion? Consult illustrations in health texts for the location of the liver and pancreas. For what process of digestion is the juice of each used?
3. With the aid of reference texts, each pupil may make in his workbook a table listing the digestive juices and the changes which take place in each part of the digestive tract in the process of digestion.
4. How is food absorbed into the blood? Consult health texts in order to understand how the finger-like structures called villi make it possible for the digested food to enter the blood. (Show section of "Digestion" film which will give a cross-section of the intestinal wall magnified.)
Demonstration: (to explain process of Osmosis).
Break away a part of the shell of an uncooked egg at the small end—leaving exposed the delicate skin or membrane underneath. (Care must be taken that this is not confused with the membrane inside the shell itself, which must be removed when breaking away the shell.) With the small end down, the egg is placed in a glass of cold water and kept until the next meeting of the class. The pupils observe that the membrane of the egg bulges out into the water. This shows that water has passed through the membrane into the egg. Has the egg white passed into the water? This is an example of the way the membranes in the body function. For example, food elements can pass through the walls of the intestines into the blood, and from the blood through the cell membranes.

Problem IV

HOW IS WASTE ELIMINATED?

Suggested Activities:

1. How are the undigested portions of the food eliminated? Point out the use of the large intestine for the storage of food waste on removal of liquid from it.
2. By looking at a diagram in a health text, locate the position of the large intestine. How are the undigested portions of the food eliminated? How may a person's health be affected by this part of their food remaining too long in the intestine? Point out that food which is not in such a condition that it can be absorbed must be moved along the tube and eliminated as waste; that these undigested substances or roughage, as it is called, are valuable in stimulating the action of muscles in the food tube. Call attention to bad effects if food remains too long in the food tube. Again emphasize the fact that as the food is moved along the food tube by the muscles it is broken up, changed into simpler substances that can be absorbed and used by the body, while residue is eliminated as waste. Show scenes 33-34 of the film, "Digestion."
3. How can one avoid constipation? What is the importance of roughage in diet? Of having a regular time for elimination? Of drinking four or more glasses of water each day? What other organs assist in elimination?

SPECIAL ACTIVITY

In order to apply knowledge learned throughout the unit to actual life situations, the following exercise may be given each pupil for investigation:

(To the pupils—from your study of the topic of digestion, consult references and write a summary in your workbook of the scientific reasons for each of the following health rules.)

1. Eat slowly and chew the food well.
2. Avoid washing food down with water.
3. Be courteous and cheerful at mealtime—avoid eating when unduly excited.
4. Eat fruits and vegetables every day.
5. Eat some dark breads and whole grain cereals.
6. Eat regularly and avoid eating between meals.
7. Avoid eating sweets except at the end of a meal.
8. Have elimination at a regular time every day.
9. Avoid exercising vigorously after a meal.
10. Always eat a good breakfast.
11. Maintain the body in good posture with abdominal wall flat and firm.
12. Engage in some form of outdoor exercise every day.

After each pupil has made such a study, a class discussion may bring together their individual findings. As another means of measuring results, the same objective test may be given as was used as an approach to the unit.

UNIT VII

TEETH AND THEIR CARE**(Four to eight periods.)***Objectives:**

1. To arouse interest in knowing more about the second set of teeth—which are the new possession of the junior high school pupil.
2. To capitalize the junior high school pupils' interest in personal appearance as a means for stimulating a desire to take better care of their teeth.
3. To enlarge the pupils' understanding of the inter-relationship of teeth and the body—and to the factors which make for mouth health.

Possible Approaches:

1. Informal discussion of the following questions:
 How do attractive teeth improve personal appearance?
 Why are sound teeth important for health?
 When did you last go to your dentist? For what purpose?
 Is there a school dental clinic in your school? What age groups are taken care of? Are junior high school pupils admitted to the clinic? Why?
 Have any pupils ever had x-ray pictures taken of their teeth? Why do dentists take x-rays?
2. Examinations of children's mouths as included in the school physical examinations: If a recent dental examination has not been made, each pupil should be urged to have this done at once. In order to encourage improvement school dental certificates may be distributed; also pupils may keep individual records on such blanks as "My Achievement Record for a Healthy Mouth." (See blank attached at end of unit.)

Problem I. — What should the junior high school pupil know about the structure of his teeth and jaws?

*Activities**Content*

How many teeth have the majority of pupils in this grade? Are there any first teeth left in the mouths of pupils? Are all of the 32 second teeth showing?

Probably the majority of pupils will have at this age 28 second teeth. Some may still have one or two deciduous molars remaining. Some may be lacking in second permanent molars (twelve-year molars).

Discuss reasons for having two sets of teeth—a temporary and a permanent one.

Teeth do not grow larger as we grow up, so there is a set for the little child and a set for the adult.

How are the permanent teeth different from the baby teeth?

The permanent tooth is much larger than the temporary tooth that it displaces, the second set being built to fit the larger jaw of the older child.

When and where do the second teeth come in?

The second teeth are growing and forming in the jaw beneath the baby teeth. When the child is about six years old the first of the second teeth begin to appear (the first permanent molar). Every year after that, until he is 12 or 14 years old some of the second teeth are making their appearance.

*Prepared for the committee by the Division of Child Hygiene, State Department of Public Health.

Activities

What are the last four second teeth to erupt?

Discuss an x-ray and what it will show about the teeth. Show photographs or actual x-rays of teeth.

What causes crooked teeth?

What can be done to correct such irregularity?

Review names, location and time of eruptions of the various teeth.

What type of teeth are found only in the second set?

Is it always necessary to lose a first tooth before getting a second one?

Show colored pictorial charts which illustrate the kinds of teeth found in the mouth.

Show the film, "How Teeth Grow" (1 reel).

Content

The wisdom teeth, located farthest back in the jaws, do not usually appear before a person is 17 or older. Sometimes they do not erupt or break through the gums but they are nearly always in the jaws as shown by the x-ray.

Figure 116 of the pamphlet,* "Dentistry and Public Health" shows some of the permanent teeth partly formed and growing in the jaw beneath the baby teeth.

Poor development of the jaw, due to under-nourishment—adenoids and enlarged tonsils which cause mouth breathing—thumb or finger sucking—lack of hard or coarse foods necessary for the exercise of the teeth—decay and too early loss of the deciduous teeth—loss of the important teeth, the first permanent molars.

They can be straightened by a dentist who specializes in such work.

Consult diagrams in health education texts—also the one-page leaflet "Your Second Teeth" which is available to teachers for pupils' use from the Division of Child Hygiene, State Department of Public Health.

Bicuspid are not found in the first set of teeth. They take the place of the baby molars.

None of the permanent molars replace first teeth, but all come in back of the position in the jaw held by baby teeth.

Such charts, published by the American Dental Association, are available on loan from the Division of Child Hygiene, Department of Public Health, or can be purchased at \$1.00 a set.

Available on loan from the Division of Child Hygiene, State Department of Public Health, this film shows the growth, development and arrangement of the teeth, the different kinds and parts and their use.

*See Note on page 31 of this pamphlet.

Problem II. — How are teeth built and nourished?

Activities

Study the structure of the tooth. Why must teeth be made of a hard substance? What other organs in the body must also be hard?

Drawings of the teeth may be made showing various views of them.

Content

Your teeth begin forming several months before birth and continue until you are sixteen to twenty-five years old. The tooth is made largely of phosphorus and calcium, as are also the bones of the body. Each tooth is built principally of three kinds of material—enamel, dentine and cement. Emphasize the fact that the enamel which covers a tooth is the hardest material in the body and that it is not easily broken or worn away if it is of good quality.

Activities

The class may also make models of teeth. Write a letter asking your dentist or dental hygienist to bring to class models which illustrate various important facts regarding the structure of the tooth. Such illustrative material may be accompanied by a short talk. Afterwards the pupils may write letters to their parents summarizing the points made.

How are teeth nourished?

Make a special study of the specific foods which are especially good for the building and maintaining of good teeth. Make a pictorial chart of such foods. From the grocery store get the cost of such foods. From such a study learn what foods will give you your daily supply of calcium for the least money. Why is milk called "the most nearly perfect food"?

Make up a day's menu which will include foods good for the teeth.

Make posters illustrating such foods which can be placed in the school halls and thus serve as a motivation for the entire school.

What is the relation of eating candy to healthy teeth?

Content

A wooden model may show the layers of dentine and enamel. Such a model may be borrowed from the Division of Child Hygiene, State Department of Public Health, and can be reproduced in the manual training class and painted by the girls.

Teeth may also be molded in the following way: With a mixture of half flour and half salt and a little plaster of paris moistened with water, a tooth may be molded by placing this mixture on the form of a tooth which has been previously sketched. When it is dry it will be the raised form of half a tooth and it may be painted in different colors to show the various structures of the tooth. Models of a set of teeth may also be made out of clay.

Teeth are nourished by food brought through the blood stream into the pulp or center of each tooth. (See unit on circulation.) A branch of the blood vessel that comes to the jaw goes through a small opening in the end of each root and up into the pulp. Capillaries from this blood vessel carry the food to the building and nourishing cells at the edge of the pulp. These cells take the food elements from the blood and send them up into the tiny tubes in the dentine. Some investigators believe that this nourishment may even go through to the enamel. Vitamins A, D and C help the tooth building and tooth nourishing cells to do their work. Even though there is enough calcium and phosphorous to work with, without the vitamins present the cells cannot build good tooth structure and they cannot keep the teeth hard and healthy. All during their formation and after they are fully formed, teeth must be nourished if they are to be healthy and to resist decay.

Interesting reports may be investigated by certain pupils in feeding rats a sugar diet. The reasons why too much sugar is not good for us are: Sugar interferes with our appetites for other foods that our bodies need, and sweet things make us want more sweets. The sugar habit takes hold before we know it if we do not watch it. One reason we put desserts at the end of the meal is so that the sweets will not keep us from eating the other foods that we need to build strong healthy bodies. We often say a piece of candy before dinner "spoils our appetite." Sugar in small amounts is good for body fuel, but sugar does not have in it the things needed to make good bones, or good teeth, or strong muscles. We need some sugar, but only a little, and we need other foods much more.

Activities

Discuss the differences in the kinds of sweets we choose.

Make a list of fruits, including dates, figs and raisins, that are more healthful substitutes for candy. An exhibit may be made of these with suggestions for purchasing.

The teacher may send a letter to the Division of Child Hygiene, Massachusetts Department of Public Health, for recipes for making fruit candies. The class may also make recipe books for mother which will illustrate attractive desserts which can be made from raw, cooked, and dried fruits.

Problem III. — More about dental decay.*Activities*

What is tooth decay or caries?

Which structure is most affected by caries?

What are the present theories for the cause of caries?

Content

Sugar is taken out of sugar beets or sugar cane and is therefore a pure or concentrated product. Children may be able to understand this idea by thinking of an apple or orange as containing sugar, but that by eating the whole fruit we eat a smaller amount of sugar than if we ate the sugar in its pure form.

Natural sweets, such as fruits, sweet young carrots, maple sugar, molasses, honey and dark sugar rather than white, are much better for us than candy and white sugar, because we are likely to eat too much of the latter, since only a very small amount is needed by the body. Too much sugar interferes with digestion and good digestion and good teeth go together.

Content

Dental caries is a disease of the enamel and dentine of the teeth, which causes softening of these structures, so that holes appear in the teeth.

Dentine is affected most, since it is softer, more porous and contains less organic matter than enamel. Because of this, there may be only a small hole in the enamel and at the same time the dentine may be badly decayed, so no hole in enamel is too small to fill. The small holes in children's teeth demand immediate attention else the decay will progress and may cause complete destruction of the teeth.

Scientists are not agreed as to the real cause of caries.

Below are the three most accepted by leaders in the dental profession:

1. The theory known as "Miller's Theory" is that lactic acid is formed under growths of bacteria on the teeth which causes a dissolution of the enamel first and then invades the dentine. There are many scientific arguments against this theory, but many dentists feel that some local element attacking the teeth starts tooth decay.
2. Another theory is that decay originates in small defects in the enamel, which only a dentist with mouth mirror and explorer can detect.
3. The third theory is that lack of proper nutrition has caused the building of faulty or weak tooth structure, which soon breaks down and becomes decayed.

Activities

How may decay be checked?

What is the result if dental decay is left unchecked?

Make wooden models illustrating progress of decay.

What may unchecked dental caries cause?

How may tooth decay cause general diseases?

Is toothache serious?

Should hopelessly diseased teeth be kept in the mouth?

Is the x-ray of any help in preventing tooth trouble?

Does it hurt to have a tooth filled?

Content

Basing our answer on the most accepted theories of the cause of decay, we must say that to check the prevalence of decay we must first build the strongest teeth possible by the best known diet for teeth, starting with the diet of the mother during pregnancy. We must have teeth examined by a dentist as soon as they are through the gums, so that small holes or defects may be treated, and then we must always keep our teeth clean, so that injurious elements will not remain in contact with the enamel to start decay.

If decay is left unchecked it progresses to the point where the pulp, or nerve, is infected and the tooth abscesses.

Wooden models, which may be opened up to show the progress of decay through the inner structure of the tooth and to contrast the arrest of caries through proper dental care, are available on loan from the Division of Child Hygiene, State Department of Public Health.

1. Pain
2. Loss of teeth
3. Faulty development of dental arches
4. Faulty mastication
5. Improper facial development
6. General disease

Infections from abscessed teeth may be carried through the blood stream to all parts of the body, causing such serious diseases as eye trouble, heart trouble, rheumatism, etc.

Yes, it may be a warning that there is a cavity, that the pulp is being injured, or that the tooth is already abscessed.

No. It is better to have them extracted by the dentist and thus prevent the possibility of injury to the general health.

The early beginning of decay between teeth may not be found even by a careful examination by the dentist with mouth mirror and explorer. An x-ray picture of these teeth will show the very beginning of softening of the teeth, so that early treatment may be instituted.

Unless the hole is deep enough to allow sensation to be transmitted to the nerves, there is no pain in drilling the hole, and filling of a small pit or fissure cavity is never painful.

*Activities**Content*

When should you visit the dentist?

Each pupil may consult his blank entitled, "My Achievement Record for a Healthy Mouth" and note the conditions which need improvement. Also, dental certificates may be distributed for use.

Visit the dentist regularly at least once a year, more frequently is advisable, for examination, cleaning and repair of small defects. Never allow the decay to progress. Only the dentist can find the first sign of a break in the enamel of your teeth. Do not wait until you have a toothache, for this usually means it is too late to save the life of the tooth.

Individual conferences with the school dentist, dental hygienist or nurse may prove of great value in stimulating the junior high school pupil to improve his own mouth condition. Since children are sensitive at this age, too much classroom discussion as to the condition of individual children's mouths should not take place in the classroom itself.

Problem IV. — What should be the junior high school pupil's own responsibility for the care of his teeth?

*Activities**Content*

Each pupil may summarize by writing a composition on the subject, "What My Dentist Can Do For My Teeth." He may include in this composition the last date on which he visited the dentist and what corrections were made. Also, he may estimate how much he spent for other things such as going to the movies, candy, sports, etc.

The dentist is part of the general health service that keeps people well and in good repair. He decides what is to be done when there is anything wrong. He not only fixes teeth that are decayed or crooked, but he will show patients how to care for their teeth. He finds rough places that he can fix before decay starts. He can tell by the condition of the mouth how healthy the body is. Our teeth and gums are indicators of general health. He will save his patients money if they go to him regularly.

Ask the school hygienist or school nurse to demonstrate before the class the most desirable types of toothbrushes and the proper care of the tooth brush—as well as a good method of brushing.

Teeth should be brushed at least twice a day—the best times being before going to school in the morning and just before going to bed at night, so that no food particles will be left on the teeth. In buying a toothbrush, choose one with a short bristle end as you will find it more efficient in keeping the various surfaces of your teeth clean. The shape of the brush is not particularly important. The bunches of bristles should be set well apart so that the brush can be kept clean easily.

Make wall holders for home use where brushes may be kept away from those belonging to the rest of the family. These wall holders can be made with a small shelf for your tooth powder or paste and a two- or three-minute hourglass to help you acquire the thoroughness necessary for the results you desire. Place the holder where the sun will shine on the brushes if possible.

Toothbrushes should be kept dry and very clean. Rinse them in cold water each time you use them. You will find it a good plan to have your toothbrushes marked so that one is used at night and one in the morning. In this way the brushes will have a chance to dry thoroughly and this will keep the bristles stiff. Once a week wash your toothbrushes with soap and lukewarm water, sprinkle them with table

Activities

Make a poster which illustrates how good clean teeth add to personal appearance.

Make a poster entitled, "Our Helpers in the Care of the Teeth" to include: the dentist, the toothbrush, foods especially beneficial for the teeth and sunshine to help build strong teeth.

Discuss with the class the pupils' responsibility for eating and learning to like certain foods which they had formerly disliked. How does being a good sport apply to the eating of all the foods which are placed before one at meal time?

It is suggested that at the end of the unit, as well as at the completion of each problem, an objective dental health knowledge test be given to the pupils concerning the facts learned.

Also, each pupil may be encouraged at repeated intervals during the school year, to record improvement on the blank entitled, "My Achievement Record for A Healthy Mouth." (See references.)

Content

salt and put them in the sun to dry. This will stiffen and toughen the bristles and prevent the growth of germs.

Culminating Activity

As a culminating activity the pupils may prepare an assembly program on the topic of the unit, at which time not only other grades may be present but parents may be invited. The school dentist or a local dentist who is willing to serve, may be asked to come to summarize the work of the unit. At this time, in addition to the activities of the pupils, the following motion pictures may be shown (available from Division of Child Hygiene, State Department of Public Health).

HOW TEETH GROW. (1 reel)

Shows the growth, development and arrangement of the teeth, the different kinds and parts, and their use. For use with grades 6 and up, and at meetings of Parent-Teacher Associations and Mothers' Clubs.

A HEALTHY CHILD. (1 reel)

Illustrates all activities in a normal child's life, stressing periodical medical and dental examinations, correct posture, proper food, wholesome exercise, care of the teeth, etc. Valuable in work with junior and senior high schools.

ASK YOUR DENTIST. (1 reel)

An excellent film for the high school and of interest to many adults.

CARE OF THE TEETH. (1 reel)

Shows the parts of the tooth, prophylactic treatment, progress of decay, and rules for home care.

Note: A series of eight colored pictorial charts available from the American Dental Association (also on loan from State Department of Public Health) describe in graphic detail all the phases of the problem (see references).

Books and Pamphlets for the Teacher

The following are available (free of charge) from the Division of Child Hygiene, Massachusetts Department of Public Health, 1 Beacon Street, Boston, Massachusetts:

A Selected Bibliography on School Health Work
Food for the School Child

Food for the Teens
 For Your Teeth and Gums (a suggested diet)
 Minerals and Vitamins
 The Home Care of Your Teeth
 School Hygiene Handbook
 Your Second Teeth
 Dental Facts For Teachers.

Dentistry and Public Health (32 page booklet) available from the American Dental Association, Bureau of Public Relations, 212 East Superior Street, Chicago, Illinois. Price, 10c per copy. 12 copies for \$1.00.

Your Child's Teeth, Folder No. 12 (Government Printing Office, 1929) available from the Children's Bureau, Department of Labor, Washington, D. C. 8 pages. Single copy free.

The Mouth Health Quarterly — July, 1932.

The Teeth and the Mouth by Leroy L. Hartman, D.D.S. Appleton-Century. New York. \$1.50. 1928.

Visual Aids

CHARTS AND POSTERS available from the American Dental Association, Bureau of Public Relations, 212 East Superior Street, Chicago, Illinois:

A Tooth Brushing Chart — price 25c

Dental Health Charts (set of 8—price, \$1.00) covering the following subjects:

1. The deciduous teeth
2. The permanent teeth
3. Diet and the teeth
4. Dental care
5. Mouth hygiene
6. Preventing decay of the deciduous teeth
7. Preventing decay of the permanent teeth
8. The teeth. (Showing the structure of a tooth, at the side, the teeth of the horse, elephant, dog, tiger and zebra.)

Dental Health Posters (22" x 28") price, set of 4, \$1.00. Emphasizes 4 dental health rules for the care of the teeth—proper food, exercise, cleanliness and regular dental attention.

FILMS available from the Division of Child Hygiene, Massachusetts Department of Public Health, 1 Beacon Street, Boston, for school children and their parents (for use with 16 m.m. machine):

Ask Your Dentist
Care of the Teeth
How Teeth Grow
The Life of a Healthy Child

TEACHING MODELS available from the Division of Child Hygiene, Massachusetts Department of Public Health, 1 Beacon Street, Boston:

A wooden model of a six-year molar showing its structure and how it is nourished. Comes apart. Three sizes.

A series of models showing progress of decay.

Your local dentist would probably supply models and teeth.

Pupil's Individual Record

MY ACHIEVEMENT RECORD FOR A HEALTHY MOUTH

Name Age Grade

	Highest possible score	Score made at beginning of Unit	Scores at subsequent examinations	
			1st exam.	2nd exam.
1. Have had a dental examination within the past six months	20			
2. Own a toothbrush	5			
3. Brush teeth in morning before coming to school	10			
4. Brush teeth before going to bed at night	15			
5. No evidences of tartar, stain or food film	10			
6. Gums clean, firm—no evidences of disease	10			
7. No cavities in teeth, or all cavities treated	30			
a. Deduct 3 points for each cavity untreated and give resulting score (30 —)				

UNIT VIII

THE TRANSPORTATION SYSTEM OF THE BODY— STUDY OF THE CIRCULATION AND BLOOD

3-6 periods

Objectives:

1. To learn what the blood is.
2. To learn how the blood does its work.
3. To learn what parts of the body help the blood in its work.
4. To find out how we can help the blood system do its work well.

Possible Approach:

Look at the blood vessels on the back of the hand, and at the wrist. Notice their differences in size, color and branching.

Problem I

Find out of what the blood is made.

Activities

Class may decide how they can best learn about the blood.* The appearance of the blood when one has a cut may be discussed first. From previous experience in the study of cells, they will probably suggest the use of the microscope.

Content

Wipe end of finger with a bit of cotton saturated with alcohol to sterilize it. Sterilize a needle by passing it through a flame. Squeeze blood toward end of finger and prick quickly. Place drop of blood on a clean slide. Cover with cover glass. Examine with high power microscope.

*If the Eastman film on "The Blood" is available, it can be used to good advantage at this point.

Activities

Ask for volunteer to have finger pricked to secure a drop of blood to study. Question about precautions necessary to secure a drop of blood.

If stained slides are available, these may be used, in addition to the slide of fresh blood.

Drawings may be made of the red and white cells, as seen under the microscope.

Content

The blood will appear under the microscope as a colorless liquid (the plasma) in which pink or straw colored round bodies are floating. These are the red cells. The white cells may not be visible since they are not so numerous (1 to about 400 red cells) and require staining to be easily seen.

Problem II

What is the work of the various parts of the blood?

Activities

Study in texts about the work of each of the parts of the blood.

Summarize these under such headings as the following:

1. Blood carries to the cells of the body the things that they need.
(List)

Content

Plasma, the liquid part of the blood, carries the blood cells to all parts of the body. Equally important are the many dissolved substances it carries including food, wastes, gases, and protective substances which help fight diseases. The plasma is largely water, a solvent for these substances.

The **red cells** contain a substance called hemoglobin which has the ability to combine with, or carry oxygen—the important chemical element constantly needed for oxidation by all living cells.

The **white cells** are of several kinds. One of their chief uses is to fight disease germs. In doing this, they may leave the blood stream, and squeeze through the very thin walls of the tiniest blood vessels in order to attack germs outside.

1. Blood carries to cells of the body the things that they need:
 - (a) Digested food—taken into the blood stream from the small intestine. The blood carries this food all over the body, and each kind of cell absorbs from the blood the particular food materials that it needs.
 - (b) Water—is taken into the blood stream from the stomach, small and large intestines.
 - (c) Oxygen—is taken up by the red cells as blood passes through the lungs.
 - (d) Body regulators—are products manufactured by the ductless glands of the body for special uses, such as regulating growth. (To be studied in a later unit.)
 - (e) Body protectors—are the white cells and certain substances in the plasma which act against disease poisons. These help us to develop immunity, or protection against certain diseases. We may have this protection against some diseases naturally, and for other diseases gain the protection against having a second attack, by having the disease. Scientists have discovered methods of developing immunity against a few diseases by inoculations.

Activities

2. It carries away from body cells the things of which they must rid themselves.

3. Blood contains substances that make it clot when blood vessels are cut.

Content

2. Blood carries away from cells the things of which they must rid themselves:

(a) Excess water, with salts—carried to the skin and kidneys to be excreted by them.

(b) Carbon dioxide—from body cells to the lungs where it is given off in the breath.

(c) Wastes—resulting from the work of cells in normal health, and special wastes from destruction of cells in sickness, carried to the kidneys to be given off.

The kidneys are a pair of bean-shaped organs lying in the center of the back. They work continuously taking from the blood wastes which are given off in the urine. During illness, the work of the kidneys is increased in ridding the body of the wastes of disease.

3. Blood contains substances that form fibres when blood comes in contact with air. These fibres entangle the red and white cells and form a clot when a blood vessel is cut.

Problem III

How does the blood get from one place to another?

*Activities**

Feel the pulse in the wrist, temple, neck. What makes the pulse?

Feel the beat of the heart. Place a finger of your right hand where the "beating" is felt most strongly.

Look at a chart of the chest to see where the heart is located in the chest.

Examine a model of the human heart, also a fresh specimen of an animal's heart obtained from a butcher.

Study pictures and descriptions of heart in texts, to learn the divisions of the heart, then locate these in model of specimen. Notice how the chambers are separated. Notice that the walls are not alike in thickness, and that the chambers are not of the same size.

Learn from texts how the heart works. Compare the action of the heart valves to the action of valves in a pump. Study the sets of heart valves in a diagram. If you can secure a stethoscope, listen to your own heart beat. Listen to the two sounds the heart makes. There is a little interval of rest between them. These sounds are said to resemble the sounds of "lup-dup."

*Use the motion picture "The Circulation" if available.

Content

The pulse is the pushing of the blood against the wall of the blood vessels by the beating or contraction of the heart.

The heart beat is felt most strongly in the lower part of the heart. The heart is a large muscle, about the size of one's fist, located on the left side of the body between the lungs. It has four divisions or chambers. The two upper are the right and left auricles; the lower the right and left ventricles. There is no opening between the two sides, but there are openings from auricles downward to ventricles. These may be closed by the valves which are seen to be made up of little flaps attached by string-like cords to the walls of the ventricles.

Blood enters the right auricle from the body, passes into the right ventricle, when the auricle contracts, and the valve between opens. Then the right ventricle contracts closing this valve, and sending the blood to the lungs through a large blood vessel called the pulmonary artery.

Activities

If you have a sheep or beef heart for study examine the cut ends of the blood tubes, attached to the heart. Notice the thick muscular walls of some and the thinner walls of others. Learn from texts the three kinds of blood tubes.

Get a live tadpole, place it on a slide under the microscope, and observe the circulation of blood in the capillaries in its tail. Find a drawing in text, or on a chart, which shows the relation of arteries, capillaries, and veins.

Press a finger of the right hand along the veins of the wrist toward the hand, and look for small swellings, as the blood is pushed backwards. These are the valves.

Have you ever seen lymph? It is the liquid you have probably seen in a "water blister."

The following questions might be discussed if time permits:

Have you ever had your "blood pressure" measured?

Why do people "blush"—have the blood rush to the face?

Content

In the lungs, the blood receives oxygen and gives up its carbon dioxide, then returns to the left auricle, through pulmonary veins. The left auricle contracts, sends blood to left ventricle, which in turn contracts, closing valve between the auricle and ventricle, and sending blood out through a large artery, the aorta, to the body. The walls of the ventricles are thicker because they have more work to do in sending the blood to the lungs and over the body.

The blood is carried from the heart by arteries, which branch into smaller arteries, and finally into the tiniest tubes, called capillaries. Capillaries join together to form veins, which carry the blood back to the heart. These tubes make an endless chain so that blood flows in a circuit.

Arteries have thick muscular walls which are elastic. The blood is helped in its flow through the arteries by the expanding and contracting of its elastic walls, as each contraction of the ventricles forces more blood into the arteries. The capillaries are microscopic, having walls only one cell layer thick. Veins have thinner walls than arteries, and are not elastic. They have valves which work similarly to those in the heart, which keep the blood from flowing backward.

The capillaries are so numerous that it is practically impossible to prick the skin without opening one or more of them. Their very thin walls permit some of the plasma to pass through into the tiny spaces which surround the body cells. Outside the capillaries, the plasma is called lymph. It carries oxygen, dissolved foods, water, white blood cells, and other substances needed by cells.

The lymph surrounds the body cells, giving them the materials they need and receiving the wastes to be carried off. These wastes are returned to the blood stream, by a separate system of tubes, called the lymph vessels. These tubes form a "one way" system, beginning as tiny lymph capillaries between the cells, uniting to form larger ones, and finally joining into one large vessel which empties the lymph into a large vein returning blood to the heart.

The blood pressure is the force with which the heart sends the blood into the arteries, and the resistance of the walls of the arteries to this force. It can be compared to the force of water in a rubber hose.

People blush because the regular flow of blood through the blood vessels of the face may be changed by nerve messages sent to them. These messages are caused to be sent by our thoughts or emotions.

Activities

What happens when a person faints?

What is "anemia"?

Why is the face reddened when weather is too warm, or why does the hand become red when placed in hot water?

Content

Fainting is the result of blood leaving the brain because of poor circulation due to temporarily weakened heart action.

Anemia is a disease of the blood, in which the number of red cells is reduced.

The blood is the part of the body which keeps our body temperature at the quite constant level of 98.6°. When we are made too warm, or too cold, by conditions outside the body, our blood flow adjusts itself to keep our temperature constant. The heat of the blood is given off through the skin. (See unit on the skin.)

Problem IV

Find out the relation between circulation and other activities.

Activities

From what has been learned about the blood, what ways can we think of to help give the blood the right substances to carry to the body cells.

How can we help the heart and blood vessels do their work?

Content

Foods of the right kind and amount should be eaten. Some foods containing iron should be included to help in the manufacture of hemoglobin for the red cells. Plenty of water is needed to keep the liquid part of the blood constant.

The heart needs exercise like other muscles. When we use our muscles, the heart also is worked harder, to supply more blood to these muscles.

When we are overtired, or sick, the heart needs extra rest, which it can get best when we are asleep or lying down. Many young people need to lie down to rest more than they do.

Good posture helps the circulation of blood by keeping organs or parts of the body free from pressing on blood vessels, allowing free flow of blood.

Stimulate the class to investigate and discuss in class the following suggested problems. (Certain pupils should be given individual problems):

What is the effect of exercise on the heart? Can exercise be overdone? Why should every boy and girl have a physical examination before engaging in athletics?

What sort of exercise would you advise and where had it best be taken?

How can a weak heart be helped so as to be able to play some games?

What effect does the use of tobacco and alcohol have on the heart?

Is the budgeting of one's time related to healthful living? How?

How are rest and sleep related to the health of the circulatory system?

*Activities**Content*

How is the proper removal of body waste related?

How is the functioning of the circulatory system related to the taking of a cold? Have the class discuss and conduct a "No-Cold-Campaign."

This will bring out that the disturbance of the circulatory system by sudden and marked changes in the temperature may be a contributing factor in contracting a cold, i.e., the main factor being the entrance of the germ.

UNIT IX

HOW WE BREATHE — STUDY OF THE RESPIRATORY SYSTEM

3-6 periods

Objectives:

1. To understand why we need to breathe.
2. To learn what parts of the body are used in breathing, and how they do their work.
3. To understand the relation of breathing to the circulation of the blood.
4. To find out how we can help the respiratory system to do its work well.

Possible Approach:

1. Determine how necessary breathing is.
Time yourself and see how long you can remain with your mouth and nasal passages closed.
How long can you stay under water after a dive?
How can deep sea divers remain under water?
Why can fish live under water?
2. Discuss the question, "What gas in the air is necessary to life?"
Do all living things, plants as well as animals, require oxygen?
3. Review the meaning of oxidation. (See Unit III.)
4. Discuss the following questions:
What is the result of oxidation in the burning candle, in a fire in a stove, in an automobile, and in the living machine? What evidence have we that the body has power?

Problem I

Why do we need to breathe so regularly?

*Activities**Content*

Think of your breathing, or watch someone else breathing. Count the number of times you breathe in one minute.

Some one may "run in place" for a minute and then count the rate of breathing.

The normal rate of breathing is about 16 times a minute. This may be increased with exercise.

Activities

Decide why we need to breathe so frequently, no matter what we are doing.

Why do we breathe so much faster during and immediately after exercising?

Content

Every cell in the body must have oxygen. The more work the cells have to do, the more oxygen is taken to the cells by the blood, and since oxygen is constantly being taken from the blood, it must constantly be replaced. Oxygen is the first essential for keeping life going. We do not take in pure oxygen. Nearly 79% of air is nitrogen, and only about 21% is oxygen.

During exercise the body produces more energy and, therefore, requires more oxygen. As oxygen cannot be stored in the body, it becomes necessary for the body to breathe faster.

Problem II

What organs enable the blood stream to pick up oxygen?

Activities

Examine a picture or chart of the respiratory system. Find out what structures make up the passageway. Draw a diagram of the organs involved in respiration.

Get from the butcher the fresh lungs of an animal with the windpipe, bronchi and blood vessels attached.

Place a glass or rubber tube in the windpipe and blow air into it. See the lungs expand. Compare them to a sponge—they hold air as a sponge holds water. Find a picture in a book or chart which shows air sacs magnified.

To find out what happens when we breathe, place your hand at your waist and take a deep breath. Feel the ribs rise, and the abdomen and chest expand outward.

Questions to discuss:

Do we get rid of all the air in the lungs every time we breathe out?

Is it a good idea to practice deep breathing exercise to get more air into the lungs?

What is artificial respiration and when is it applied?

Content

The air first enters the nose, which leads to a larger passageway behind it—the pharynx, into which the mouth also opens. The pharynx opens at its lower end into the windpipe (trachea) and into the esophagus which leads to the stomach.

The windpipe divides into two short branches, called bronchi, which connect with the two lungs. The lungs appear from the outside like two soft pink sacs. When seen in a cross-section, they show that they are made of many tiny branches of the bronchi, which extend throughout the lungs. Each microscopic air tube or branch ends in a little rounded air sac.

The blood vessel bringing impure blood to the lungs from the heart, divides as it enters the lungs, and branches throughout each lung as the air tubes do. Finally, a capillary surrounds each air sac. Through the thin wall of the air sac and the capillary, the exchange of oxygen from the air sac to the blood, and the carbon dioxide from the blood to the air sac, can take place.

Each time we breathe in and out, the chest is made larger, then smaller. A large dome-shaped muscle, called the diaphragm, which extends across the body separating the chest from the abdomen, helps in this process.

As the diaphragm contracts when we breathe in, it flattens out, pushing down on the organs in the abdomen, and giving more space for the lungs to expand. At the same time, the muscles between the ribs contract and raise the ribs, making the chest larger. When the chest becomes smaller by the relaxing of these muscles, air is pushed out of the lungs.

Content

The lungs have a large reserve of air. Each time we breathe normally only a small part of it is exchanged.

We do not ordinarily need to practice deep breathing, because our breathing is automatically controlled to furnish all the oxygen the body needs at that time. Deep breathing does help the circulation of the blood by the action of the diaphragm on the organs of the abdomen.

Some boy who has received a first-aid or life-saving certificate may demonstrate the process of artificial respiration and explain its use.

Problem III

What is the special work of some of the structures of the respiratory system?

Activities

Discuss the many different kinds of air we breathe—cold, moist, warm, dry, dirty. How can the lungs be protected from harmful conditions of the air?

Feel the voice box or "Adam's apple" in the throat. Look at a model or picture of the larynx. Especially notice the epiglottis, or trap door, which closes down when we swallow, so that food cannot pass into the windpipe.

Find a picture of the sinuses of the head. Observing that the sinuses are normal structures should help to correct the very common misunderstanding that they are a disease.

Content

The nose warms, moistens, and cleans the air we breathe. It also tests it by smelling so that we do not stay where air is too harmful, for example, in dense smoke or fumes.

The voice box, or larynx, opens from the front of the pharynx, above the windpipe. Air passes through it from the pharynx to the windpipe. When we speak or sing, the air passing through it sets the vocal cords in vibration making different sounds according to the position or tension of the cords.

Our voice is also affected a great deal by the condition of the sinuses of the head. These are cavities in the skull, connected to the nose. When air can circulate properly in these, the voice has a much better quality, than when they are diseased and air cannot resound in them.

Problem IV

What can we do to help the work of the organs of breathing, and to prevent the very common diseases which affect them?

Activities

Do you know if you always breathe through your nose?

Do you know how many colds you have had in the past year?

The subject of colds should be very thoroughly discussed—the precautions to take to prevent them, and the proper treatment of them.

Content

Nose breathing is the proper way. If one breathes through the mouth, he should find out if there is any obstruction in the nose—irregularity of structure, or adenoids, or if mouth breathing has become a habit.

Since there is no known cure for colds, we should all try harder to prevent this most common disease.

Colds are probably caused by germs too small to be seen under the microscope. They enter the nose and throat from the air or on articles touching the nose or mouth.

Activities

The class may work out a plan for their school to try to reduce the number of colds, or individuals may try practicing some habits which they have decided will help them to prevent colds.

Discuss the possible seriousness of "sore throats" and why one should never neglect them.

Write down the facts you have learned which may help you to prevent having colds.

Content

To prevent colds it is necessary to avoid people who have them, and to keep up our resistance by having proper food, rest, sleep, outdoor exercise and sunshine. Rest in bed at the first sign of a cold will often prevent its development.

Sore throat is a common symptom of many diseases—colds, diphtheria, scarlet fever and some other serious infectious diseases. They are also frequently caused by diseased tonsils which may need to be removed. One should have a doctor examine a very sore throat.

UNIT X

THE SKIN AND ITS USES

2-4 periods

Objectives:

1. To learn of what the skin is made.
2. To understand how the skin protects us from injury and infection.
3. To learn how the skin helps to regulate the temperature of the body.
4. To find out what we can do to help the skin do its work, and to improve its appearance.

Possible Approach:

Pinch the skin on the back of the hand, the face, and the palm of the hand. Notice the differences in the thickness. See the difference in appearance too, when examined closely. Why should the skin vary in thickness?

Problem I.

Find out of what the skin is made.

Activities

Class may suggest characteristics of the skin which they have observed, or which they have already learned.

The forming of callouses, corns and blisters may be suggested as showing how the skin is made and some of its uses.

Decide what is happening when you rub off small bits of skin after bathing.

Press the skin gently with a pencil or pin point. Notice that you feel on all surfaces of the skin. What part of the skin do we use for feeling? (The ends of the fingers are very sensitive.)

Content

The skin is observed to be a tough, strong and somewhat elastic covering for the body. Its thickness is greater on parts of the body where it would be more easily worn, such as the palms of hands and soles of the feet.

The skin is very sensitive—it can tell us a great deal about anything it touches.

The skin has two layers, the outer is called the epidermis or cuticle, and the inner is called the dermis or true skin.

Activities

Rub the skin of the arm briskly, and see what happens. Evidently the blood vessels are very near the surface.

Pull a hair on the arm. Notice that this pulls the skin. The hair roots are seen to be deep in the skin.

Notice the tiny drops of perspiration in the palms of the hand.

Where does the oil on the hair come from?

*Look at a chart or picture in a text showing the two layers of the skin.

Content

The outer layer is made up of several layers of cells which grow from the bottom layer. They receive their nourishment from the blood vessels and lymph below in the dermis. These cells are continually growing outward to the surface, as new cells are formed by the bottom layer. They gradually become flattened, lose their vitality, and finally are cast off from the surface as dead cells. The hair and nails grow from cells in the epidermis.

The dermis is made up of many blood vessels, nerves and nerve endings, and sense organs which enable us to feel pain, pressure, heat and cold. It also contains sweat glands, oil glands and hair roots.

Problem II

Find out how the skin protects us from injury and infection.

Activities

Do many plants and animals have a skin which may be compared to our skin? What seems to be the purpose or the uses of the skin?

Discuss what happens when the skin of an apple is removed. What happens if the apple is touching another apple? What happens when apples are peeled, strung, and hung in a dry place?

Review what has been learned about the action of bacteria, and the conditions necessary for bacteria to grow.

Discuss what happens when one gets a cut finger.

Review what was learned in the unit on the blood about the action of the white cells in destroying germs.

Explain briefly what goes on in a badly infected cut, and what we should do to help stop the infection.

Content

Most plants and animals have a covering that seems to have uses like our skin. The chief purpose seems to be protection from anything that might injure the body. Another use (in warm-blooded animals) is keeping the body warm.

An apple will usually spoil quickly after the skin is removed if in a damp place, or in contact with germs.

When apples are prepared to dry, they do not spoil because of the lack of moisture needed by bacteria. The skin of the apple prevents the evaporation of moisture within the apple, and when it is removed, the juice of the apple evaporates. In a similar way, the skin prevents evaporation of water from the body.

Since bacteria are always on the surfaces of the skin and on all objects that are not made sterile, they are taken into wounds made by knives, nails, etc. They are given a chance to grow in the skin, since it is warm and moist. Serious dirty wounds should have the care of a doctor or nurse. Smaller cuts may be treated with iodine, and a sterile bandage applied so as to allow air to get to the wound.

*The film on "The Skin" may be used here.

Problem III

How does the skin help to regulate the body temperature?

Activities

Discuss what happens in the skin on very warm days.

Show the effect of evaporation by placing a few drops of ether or alcohol on the back of the hand. What makes it feel cold?

What happens in the skin on cold days?

Review what has been learned about oxidation and the use of muscles. How is the heat produced by exercise prevented from raising the body temperature?

Content

The skin helps in two ways to keep us from being overheated when the air is too warm.

The sweat glands give off perspiration which evaporates and cools the body by taking heat from the body, since evaporation always takes heat from surrounding material.

At the same time more blood flows to the surface of the body than usual, and heat is given off from the blood. In this way the body heat is kept from rising above normal (about 98.6 degrees).

The skin perspires much less in cold weather. The blood does not flow to the surface as much in warm weather. However, if one is out in very cold, windy weather, the redness of the face shows that the blood flow has increased in the face to keep it from becoming chilled.

Increased perspiration, and blood flow in the skin cause cooling of the body in the same way described above for warm weather. Exercise increases circulation throughout the body so that the cooling processes work more efficiently than when one is at rest.

Problem IV

How can we help the skin to do its work, and have a healthy appearance?

Activities

From what has been learned about the structure and function of the skin, the class should decide what is most necessary in the care of the skin.

Discuss the need for frequent bathing, how to shampoo the hair, how to care for the nails, and the possible value of cold baths.

Make a list of things we know are injurious or irritating to the skin, and learn how one may avoid them, or how they may be treated.

Content

Keeping the skin clean is necessary for several reasons. It helps remove bacteria, removes the wastes given off in perspiration, and excess oil.

Proper foods are necessary to nourish the skin. We should not attempt to nourish it by using so-called "skin foods" applied to the surface.

Exercise to improve circulation will aid the skin.

Clothing suitable to the season and climate will help the skin keep the body temperature normal without taxing the body.

The list of things which may harm the skin may include burns, strong soaps, poor or too many cosmetics, insect bites, poison ivy, poison oak, excessive rubbing of skin which causes blisters or corns, wrong methods of removing blackheads, picking "pimples," etc.

UNIT XI

TUBERCULOSIS AND HOW IT MAY BE PREVENTED

(A separate unit on this topic may be obtained from the Massachusetts Tuberculosis League, Little Building, Boston, Mass.)

UNIT XII

A BALANCED AND PROTECTIVE DIET*

4 to 8 periods

Objectives:

1. To help pupils to have an increased understanding of the energy value of food by understanding the simple concept of the calorie—and to appreciate why it is especially important during the high school age to eat the necessary daily amount of food.
2. To develop more appreciation of the part taken by vitamins in a diet necessary for growth and health by studying the method by which scientists came to prove their value.
3. Appreciation that nutrition cannot be treated as a separate topic, but must be thought of as a part of the entire regime of "Healthful Living," including rest, sleep, recreation, etc.
4. To maintain and build intelligent food practices in the present lives of pupils—the meaning of a balanced diet.

Possible Approach:

The class, of course, already possesses some information regarding the food needs of the body, since the topic has in previous years been introduced from different angles in the Health Education Course of Study. However, since there is much essential material on nutrition which is more advanced than should possibly be taught the younger pupil, the topic should again be studied in order to emphasize for the ninth grade pupil some of the more advanced aspects of nutrition. At this age level the pupils are old enough to realize something of how, through research, the science of nutrition has developed and to understand that new discoveries are adding constantly to the present knowledge of the topic. The method also in teaching the unit may be different in that the older pupil may be encouraged to consult a greater number of references and to collect from various sources pamphlet materials on the topic. In order to find out the facts already possessed by the class, the following objective tests may be given.

Suggested Objective Test:

DIRECTIONS: Four answers are given to each of the following questions. Read carefully each question and the four answers. Decide which answer is the best, and put an X on the dotted line in front of it. If you mark more than one, your answer will be called wrong.

EXAMPLE: We should have fresh air:
especially in the summer
in the daytime, but not at night
 ---X---all of the time
when we begin to get a headache

*Prepared for the Committee by the Division of Child Hygiene, Massachusetts Department of Public Health.

1. Candy should not be eaten between meals because:
 - _____it is bad for the teeth
 - ☒ X _____it spoils the appetite
 - _____it makes you fat
 - _____it contains coloring matter that is injurious
2. The most important reason for boys and girls to drink milk is because:
 - _____it makes them fat
 - ☒ X _____it contains more necessary elements for growth than any other one food
 - _____it is always pure and easy to get
 - _____it is easy to digest and quick to drink
3. Vitamins are especially necessary for:
 - _____supplying energy
 - _____giving roughage to food
 - ☒ X _____promoting health and growth
 - _____regulating body temperature
4. One of the chief causes of decayed teeth is:
 - ☒ X _____eating food lacking in calcium while the teeth are growing
 - _____using our teeth for biting threads and hard candy
 - _____brushing them too often
 - _____not enough meat in the diet
5. The bones:
 - _____do not need food after we are grown up
 - ☒ X _____are supplied with food by the blood
 - _____do not change as we grow older
 - _____need nothing but time to grow
6. A clear, smooth, rosy skin chiefly depends upon:
 - ☒ X _____cleanliness and food
 - _____the weather and climate
 - _____the use of cosmetics
 - _____having frequent facial treatments
7. Of the following, the best breakfast is:
 - _____buns and coffee
 - _____orange juice and toast
 - ☒ X _____orange juice, cereal, poached egg on toast and milk
 - _____cereal and milk
8. Of the following, the best combination for a school lunch is:
 - _____hot roast beef sandwich, potatoes and rolls
 - _____macaroni, salad, rolls and cake
 - _____banana fritters, milk and rolls
 - ☒ X _____soup, vegetable salad, roll, fruit and milk
9. If one eats between meals, the best thing to select is:
 - _____sandwich and milk
 - ☒ X _____fruit or milk
 - _____cake, cookies or candy
 - _____hot dog and tonic
10. Of the following, the best balanced dinner is:
 - _____hamburg steak, French fried potatoes, peas, milk, chocolate cake
 - _____creamed chicken; lettuce, tomato and cucumber salad; apple pie and cheese
 - ☒ X _____roast beef, baked potato, peas, lettuce, rolls and butter and custard pie
 - _____soup, fried pork chops, mashed potato, boiled onions, pears and cookies

11. Boys and girls need to drink plenty of water daily because:
.....water furnishes power to work
...X...the body needs to replace water lost through excretion
.....water gives heat
.....water thins the blood
12. The food containing the largest amount of regulating and protective materials (vitamins and minerals) are:
.....sugar
...X...fruits and vegetables
.....rolls and butter
.....Hamburger sandwich
13. While eating, it is a good thing to:
.....talk about your troubles
.....think of how you dislike what you are eating
.....read a detective story
...X...feel comfortable and happy
14. Of the following, the best reason for including meat, fish or eggs in the diet is:
.....they provide a large amount of carbohydrate and fat for energy
...X...they provide protein for muscle building
.....they are cheap
.....they are attractive and of good flavor
15. Of the following, the foods which are richest in carbohydrates are:
.....fruits and vegetables
...X...cereals and breads
.....meat, fish and eggs
.....butter and salad oil
16. Knowing about calories is important because it helps us:
.....to use our arithmetic
.....to tell our parents something they do not know
...X...to see whether the amount of our food fits us
.....to make a set of food models for our classroom
17. The number of calories we spend in a day depends on:
.....the weather
.....what we have to eat
...X...what our activities are
.....what we think about
18. Calories for our activities come from:
.....the air we breathe
.....the water we drink
.....the books we read
...X...the foods we eat
19. The most calories are spent when you are:
.....sitting quietly
...X...running
.....walking
.....lying in bed
20. The most important thing which may be learned from an animal experiment is that:
...X...food makes a difference in growth and health
.....rats live in cages
.....rats will eat foods that boys and girls eat
.....rats have bright eyes and clean fur

21. Food fads are dangerous because:

- _____they change too often
- _____they make us eat foods we dislike
- ☒ _____they are not suited to all individuals
- _____they provide unfamiliar foods

Suggested Problems:

I. How is the necessary amount of daily food measured?

Activities

Each pupil may make a list of the kinds of exercises he takes each day. Consult health textbooks in order to review or to learn where the body gets the power to work and play.

(The process of oxidation by which the body produces heat and various waste products, brought about by a combination of the oxygen in the air and the food eaten has already been discussed in the series of units suggested for Grade VIII, see Units III, IV, VI)

Consult reference textbooks in order to find out what determines the body needs for energy foods.

Discuss in class which of the following activities use up more energy:

The man walking down the street, or the man climbing the stairs?

The boy sitting and reading, or the boy skating?

The girl lying down, or the girl sitting and knitting?

Each pupil may list the various ways in which he spent calories in the last twenty-four hours.

Find out what is the **measure** of the amount of fuel needed by the body.

Content

From energy-giving foods—the chemical union of part of those foodstuffs in the muscles, with the oxygen borne by the blood, brings about combustion—and thus the production of heat or energy to work or play.

The amount of energy-giving food needed varies with the **age, weight** of the person and the **kind of work** done. Every movement voluntary or involuntary means an increase in the combustion of body fuel. Even during sleep, there is constant movement. It has been shown that even the process of thinking uses up energy. Heavy work demands correspondingly more energy food. Life means work. When work is done, fuel is demanded.

Just as the amount of gasoline needed by an automobile is measured in gallons, the energy value of food is measured in units called **calories**. One calorie of heat energy is sufficient to warm about one quart of water 1° Centigrade. The calorie, which is a term borrowed from physics, is accepted as the measure of energy food needed for our activities. Whereas pupils at this age are not expected to understand all the process by which this was arrived at, they can, however, get an acquaintance with the term and develop some appreciation of what it means.

Activities

Consult health texts and other sources in order to see how many calories you should eat a day for your age.

Compare the energy value of various **foods**. Consult references for tables which give such information. Make bar graphs and posters which will illustrate the foods which are best sources of carbohydrates.

Why do girls and boys from ten to fifteen years of age usually need a larger number of calories for each pound of body weight than do older people?

Make a list of all the foods you eat, including meals, for three days, including the sauces on foods; candy, fruit or cookies, etc.—eaten between meals. Be sure to put down the size of the serving or number of pieces of toast, etc.

About how many calories did you eat yesterday? Calculate this number roughly.

Opposite are four breakfasts. Copy them on the blackboard for the pupils' consideration. Discuss each in class. Analyze actual breakfasts of individual pupils. What type of breakfast will provide the 25% of the energy high school pupils need for the day? Conduct a campaign for each pupil to improve the standards of his breakfast.

Consider the following possible reasons why individual breakfasts didn't measure up as to calories.

1. **Because** John wasn't hungry?
2. **Because** John stayed up too late the night before, so he wasn't rested enough to have an appetite for breakfast?
3. **Because** John was in too much of a rush?

Content

Tables are not to be memorized, but discussions on a table such as the one below may stimulate much interest.

Caloric Requirement (Sherman, 1932)

Age Years	Boys Calories	Girls Calories
12-13	2300-3000	2100-3000
13-14	2500-3500	2300-3400
14-15	2600-3800	2400-3000
15-16	2700-4000	2400-2300
16-17	2700-4000	2200-2800
17 yrs. on	2800-4000	2250-2800

From pamphlet "Food for the Teens," (Massachusetts Department of Public Health).

Such tables are not to be memorized but used for emphasis and as sources of information for the making of graphs and posters.

They are still growing and are usually very active in outdoor games and sports.

See "Food Check for High School Pupil" attached to unit.

See figures on page 7 of pamphlet "Food for Teens."

	Calories	
Orange juice	100	
Toast-	100	(2 slices)
butter	75	
Coffee-		
cream	20	
sugar	40	
	335	
Orange juice	100	
Oatmeal	100	
Milk (1½ cups)	240	
Toast	150	(3 slices)
Butter	100	
	690	
Orange juice	100	
Oatmeal	100	
Milk (1½ cups)	240	
Egg	70	
Toast	150	(3 slices)
Butter	100	
	760	
Orange juice	100	
Milk	160	
Toast	150	(3 slices)
Butter	100	
Egg	70	
	580	

Activities

Discuss the causes of underweight. Write a paragraph on how a high school pupil would go about planning to gain weight.

Discuss the causes of overweight.

Discuss the danger of reducing medicines and dieting.

II. What are the so-called protective foods?

Activities

Find out the differences between animal and vegetable proteins.

Make a chart showing the use of each in the body and the foods which supply them.

Find out how minerals protect the body. List as many as possible of the minerals with their use in the body and the food supplying them.

How did the knowledge of vitamins come about? Read stories of their discoveries.

Content

A common cause of malnutrition is eating the wrong kind and amount of food. Also, illness, the presence of some physical defect, worry, getting angry and excited all tend to use up energy that should be used in building up the body. Inherited and racial tendencies also are factors in body building.

Eating too large an amount of food is the chief cause of overweight. Also, lack of exercise is a factor. Some few high school pupils are overweight because some of the glands of the body are not working properly.

Content

In grade IX, this topic should be approached from the angle of having pupils themselves do outside reading and make individual reports on assigned topics. (See list of popular references given at end of unit.)

For example:

Proteins**Animal****Vegetable**

Animal	Vegetable
Use	
Sources	

In answer to this question the class may consult references to learn that through long years of observation of diet in relation to disease and through controlled animal feeding experiments, scientists have been able to prove the value of vitamins to diet. Experiments have proven that vitamins are essential to promote growth and protect the body against certain diseases. (See special references at end of unit.)

Activities

Conduct a rat-feeding demonstration showing the effect of good and poor choices of everyday foods.

Content

Rat-feeding demonstrations may be carried on to show the difference between good and poor choice of foods. For example, a rat fed on white bread and coffee shows the effect of an inadequate diet, though white bread is a good food. On the other hand a rat fed on whole bread and milk will show good growth because these two foods are supplementary to one another, whereas coffee has no food value. Such an experiment illustrates common human dietary discrepancies in choice. (For more details as to how such a demonstration may be carried on, see directions at end of unit.)

Special Activity

Make a table for each of the vitamins A, B, C, D and G showing use in body, results of absence and foods containing each, using health education textbooks and pamphlet materials. ("Food for the Teens," available to teachers from Massachusetts Department of Public Health, contains this information.)

Suggested Form

Name	Use in Body	Results of Absence	Foods Containing

Make a list of the foods appearing most often on the preceding lists. Are they included in your own meals daily or often? How will you go about learning to eat those you do not already like?

III. What is the meaning of a balanced diet?*Activities*

Study foods in relation to each other. Find out the criteria for an adequate daily diet. Is appetite a safe guide? Develop a set of rules which will guide you in a wise selection. Discuss in class why we need to choose our foods from all groups instead of just one or two. Discuss the well-balanced diet.

From your study of "The Measuring Stick for Good Nutrition," discuss how these foods may be fitted into three good meals a day. Practice menu planning. Make posters which illustrate a good breakfast, a good dinner, a well-chosen lunch at school or home.

Content

This information may be found in such leaflets as "Food for the Teens" and "Does Your Family's Food Measure Up," available to teachers from Division of Child Hygiene, Massachusetts Department of Public Health. Also, consult general health education and nutrition textbooks.

Ask home economics teacher for references on menu planning.

Activities

Why is milk often called "the most nearly perfect food"? Find out all the food elements it contains.

Discuss in class the factors, other than food, so important to good nutrition. Each pupil may make out a daily time budget showing time spent in sleeping, eating, recreation, etc. Make spherical graphs illustrating a well-balanced day.

IV. The school lunch—what is it to you?

Activities

Choose your lunches for one week.

Discuss the following questions—

1. What are your daily food needs (review Problem I)?
2. Does your lunch fit you as to kind and amount of food?
3. Is it adequate for your age, activity and fitness?
4. Is it adequate in relation to the other meals of the day?
5. Are your meals adequate without indulging in snacks? Are you spoiling your appetite by cheating yourself out of well-balanced meals by eating candy, sodas or sundaes between meals?

Make out a score card or checking system which can be used to judge the adequacy of lunches in your school.

Get permission from lunch manager to allow a committee to check the trays of the pupils—using checking system worked out for your school.

Get lunchroom manager, home economics pupils and parents to help you find ways of getting your money's worth in food for lunch.

Content

A simple classroom experiment may be conducted by the teacher on the food elements found in milk. For directions see "Teaching Nutrition to Boys and Girls" by Mary Swartz Rose, Macmillan Co.; the health education textbook, "Keeping Fit" by Wood, Phelan, Lerrigo, Lamkin & Rice or any general science textbook.

Review chapters on Healthful Living in general health education texts. Also see pamphlet "Food for the Teens."

Content

Use pamphlet "The Measuring Stick for a Good School Lunch," Massachusetts Department of Public Health, "A Lunch," National Dairy Council, "The Packed Lunch," Massachusetts Extension Service.

Health education texts should be consulted in order to review the facts regarding the dangers of overindulgence in candy.

This will differ according to the time of the lunch period and the opportunity of children for eating a regular lunch at home after school.

Make a study of lunchroom practices

To include:

- Number buying lunch at school.
- Number bringing lunch from home.
- Number buying supplement for home lunch.
- Number buying food outside of school.
- Average amount spent by pupil for regular lunch.
- Average amount spent by pupil for supplemented lunch.
- Average amount spent for candy, cake and packaged crackers or potato chips.

*Activities**Content*

Make a list of supplementary food for the home-packed lunch which can be purchased at the school cafeteria

for 5c
for 10c

Plan poster and bulletin board displays which will help to promote better lunches.

Plan and carry through an assembly or P. T. A. program on the school lunch.

Make a survey of lunchroom standards.

Average amount of time allowed
Is air in room fresh?
Is temperature right?
Is atmosphere peaceful?
Do you help to keep the room neat?
Do you use the facilities for hand-washing before eating your lunch?

Discuss in class what has been learned which may be applied if pupils were working at a job and ate at a commercial restaurant.

Parents, school officials, students and outside speakers may cooperate in this.

Survey cards and nutrition consultation service are available on request—Massachusetts Department of Public Health.

Directions for Animal Feeding Experimentation

Good health and growth depend on adequate, well-chosen foods in the proper amounts. An animal confined on a diet of one or two foods that are in themselves good foods, but not adequate in all the necessary food substances, shows the effects of this inadequacy by failing to grow and poor physical condition.

Rat-feeding demonstrations may be carried on to show the difference between good and poor choice of foods. For example, a rat fed on white bread and coffee shows the effect of an inadequate diet, though white bread is a good food. On the other hand a rat fed on whole wheat bread and milk will show good growth because these two foods are supplementary to one another, whereas coffee has no food value. Such an experiment illustrates common human dietary discrepancies in choice.

A suggested Rat-Feeding Demonstration to show the effect of good and poor choices of everyday foods.

1. Put four 28-day old rats of as nearly the same weight as possible on the following diets.
 - a. One pair on whole wheat bread plus whole milk.
 - b. One pair on whole wheat bread plus coffee.

or

 - a. One pair on white flour plus milk.
 - b. One pair on white flour plus coffee.
2. Each day put into each cage $\frac{1}{4}$ slice of bread; about one tablespoon of milk or coffee in a small cup according to the directions above. Let the rats eat as much of this as they wish; remove any left-overs when cleaning the cage the following day.
3. After four to five weeks on the above schedule, change the second pair of rats to the same diet as the first pair; namely, bread and milk. This allows them to finish the experiment in a state resembling positive health.

Length of experiment—8 to 12 weeks.

Observations—At the beginning of the experiment and at each regular weekly weighing, the growth, habits, disposition, condition of the fur and eyes, and straightness of the limbs should be recorded.

Construction of the cage—

1. A piece of galvanized wire screening—3 squares to the inch—9 x 30 inches.
2. One to two yards of copper wire.
3. Two pans approximately ten inches in diameter and two to three inches in height. (Cake pans will do.)

To make cage—Turn edges of wire screening under about $\frac{1}{2}$ inch. Roll into a cylinder about 11 inches high and 9 inches in diameter. Lap over and sew together with copper wire. Place in the pan a layer of newspaper which has been cut to fit. Set the cage in the pan. Cover with the second pan.

If cages have to be moved, the pans may be made secure by twisting three strands of copper wire through two holes made in the pan and the wire of the cage. These wires may be easily untwisted when it is necessary to clean the pans.

Food and water cups—squat jelly glasses, vaseline or cold cream jars may be used. The glasses resting on the bottom of the cage may be kept secure by fastening to the side of the cage with copper wire.

Care of the cage—

1. Provide a fresh supply of water daily.
2. Change papers in the bottom pan daily.
3. Twice a week scrub food cups in hot soapy water.
4. Once a week scrub the pans to prevent odor.

Care of the rats—

1. Keep in a fairly constant temperature since they are easily susceptible to colds.
2. If kept in a recitation room, place them in a corner where they will not be disturbed.
3. If rats are carried from school to school in cold weather, wrap cages in newspaper.
4. Do not handle or allow students to handle the rats unnecessarily.
5. To protect rats from drafts cover cages with newspaper or blanket.
6. Arrange to have someone care for the rats over week-ends as well as on school days so as not to interrupt the continuity of the experiment.

The National Dairy Council of Chicago has a nine-page mimeographed leaflet giving directions for rat experiments of several different grade levels. It is entitled "Rat Experiment A.D.A. 31"—the cost is 10c.

See also—"Teaching Nutrition to Boys and Girls" by Mary Swartz Rose, published by Macmillan Company, New York.

Food Check for a High School Student

	First Score	Second Score	Third Score	Fourth Score
POINTS				
MILK				
1 quart to 3 cups daily	20			
1 pint daily	10			
VEGETABLES (one serving of potatoes)				
3 servings daily	10			
2 servings daily	5			
If one serving is green or raw add	5			
FRUITS (fresh, canned or dried)				
1 or more servings daily	10			
TOMATO, ORANGE, GRAPEFRUIT OR RAW CABBAGE				
1 serving daily	10			
4 servings weekly	5			
MEAT, FISH OR CHEESE				
1 serving daily	10			
EGGS				
5-7 weekly	10			
4 weekly	5			
WHOLE GRAIN CEREAL OR BREAD				
2 servings daily	10			
1 serving daily	5			
BUTTER				
At each meal	5			
WATER (Plenty—depending on activity, weather, size)				
At least 4-6 glasses daily	10			
Total credits				
DEDUCTIONS				
Complaining about food	10			
Use of tea or coffee	10			
No breakfast	10			
Sweets between meals	10			
Rushing at mealtimes	10			
Total deductions				
Total score				
For explanation look on back of card.				

NAME ADDRESS

Directions For Using Food Check

Check yourself upon the way you generally select your food, not upon your occasional practice. If your total check is between 60 and 80, it is only fair; if below 60 it is poor. A person who gives himself 100 will receive enough vitamins and minerals. These are very important for growth and "pep."

SIZE OF SERVINGS — The size of a serving of fruit, vegetable, or cereal is about one-half a cupful. The amount varies with your size and activity.

MILK — Half of the milk may be skim milk or buttermilk if butter is used. Milk that is cooked in food may be counted. Evaporated milk may be counted.

VEGETABLES — If it does not seem possible to have 2 varieties of vegetables, the same check is given for 2 servings of the same vegetable.

GREEN OR RAW VEGETABLES — Includes all leaves and vegetables green in color, such as spinach, kale, Swiss chard, broccoli, beet greens, dandelions, cabbage, lettuce, endive, green peas, green beans; raw carrots, raw celery, and raw onions.

ORANGE, TOMATO, GRAPEFRUIT, OR RAW CABBAGE—An additional check is given for these foods because of their richness in vitamin C.

MEAT, FISH, OR CHEESE — Are all muscle builders and should be served at least once a day.

EGGS — In addition to being good muscle builders, eggs are valuable for their minerals and vitamins. Egg yolk is an especially good source of iron.

WHOLE GRAIN CEREAL OR BREAD — Includes cereal puddings as well as dark breads and cereals.

WATER — May be taken before breakfast, between meals or at meals.

ADDITIONAL FOODS to meet calorie needs will be added and are not considered here.

NAME:

AGE:

TOWN:

Please keep record of all food eaten for 3 days of one week.

Put down kind of food eaten, how cooked (fried, baked, boiled), and amounts eaten.

Remember to write down—milk on cereal; sugar in cocoa; gravy; salad dressing; syrup; cod liver oil.

If child eats between meals, make note in proper space.

Breakfast

Dinner

Supper or lunch

Between meal foods

<i>Amt.</i>	<i>Food</i>	<i>Amt.</i>	<i>Food</i>	<i>Amt.</i>	<i>Food</i>	<i>Amt.</i>	<i>Food</i>
<i>1st day</i>							
<i>2nd day</i>							
<i>3rd day</i>							

Popular References Concerning the Discovery And Use of the Vitamins

MARGARET GAUGER, Ph. D. *Vitamins and Your Health*. McBride. New York.

MCCOLLUM & SIMMONDS. *Food, Nutrition and Health*. Published by authors. Baltimore. 1933.

MARY PFAFFMAN & FRANCES STERN. *Food and Your Body*. Barrows. Boston. 1932.

JEAN BROADHURST & MARION LERRIGO. *Health Horizons*. Silver Burdett & Co. New York. 1931.

A. S. HILDEBRAND. *Life of Magellan*. Harcourt. 1924. Gives a vivid account of the terrors of scurvy to the sailors of the time.

RUTH E. GROUT. *Handbook of Health Education*. Doubleday, Doran. New York. 1936. Has helpful bibliography and ideas.

PAUL DEKRUIF.

<p>{ <i>Hunger Fighters.</i> <i>Microbe Hunters.</i> <i>Men Against Death.</i></p>	<p>Available in public libraries or through any bookseller. \$1.00.</p>
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A new play called *Soldiers of Science* by Ruth L. Hoesly—1937, is supplied without charge by the Education Department of the Wisconsin Alumni Research Foundation of Madison, Wisconsin. This depicts the highlights in the field of vitamin research.

The United Fruit Company, 1 Federal St., Boston, has considerable material on the banana and vitamin C, including an interesting account of the experiences of Count Von Luckner during the World War. This is free on request.

The Irradiated Evaporated Milk Association, 253 North Wabash Avenue, Chicago, Illinois, also has a number of booklets including experiments, but the most valuable for this use would seem to be *The Story of Evaporated Milk* and the wall chart, and the *Unit on Irradiated Evaporated Milk* and the poster.

Junior Red Cross News—January, 1934, interesting article by Ethel M. Smith, "Dinner is Served at the South Pole."

Nutrition Charts—50c set—Bureau of Home Economics, U. S. Department of Agriculture, Washington, D. C. Order through the Superintendent of Documents.

Graded leaflets and charts on nutrition—Dairymen's League Co-operative Association, 11 West 42nd St., New York City. National Dairy Council, 111 North Canal St., Chicago, Illinois. Send for price lists.

Metropolitan Life Insurance Co.—*Health Bulletin for Teachers*—monthly through the school year. See the January, February, March, 1936, issues on "Scurvy," "Anemia," and "Diabetes."

Nutrition Notes—Lucy Gillet—50c, through the school year—A. I. C. P., Nutrition Bureau, 105 East 22nd St., New York. Particularly useful for home economics classes.

Hygeia—American Medical Association, Chicago, Illinois—monthly magazine available in school or public libraries. See the following issues especially:

Jan. 1936—"Rickets"—Rachel Ash. "1936 Models in Diet"—C. W. Liet.

April 1936—"How Disease Came with the White Man"—P. Washburn. "Dietary Delusions"—Harriet Morgan.

May 1936—"Some Bread Today"? Photographs.

June 1936—"The Quest for Iodine"—Wm. Plummer.

Aug. 1936—"The Compatible Eating Fad"—C. W. Liet.

Sept. 1936—"For the School Lunch Box."

Nov. 1936—"Curious Stories about Health." "Willie, Pull Your Stomach In."
"Sweet Tooth Joe"—Inez Jenkins.

Dec. 1936—"The Dumb Cluck Becomes a Scientific Milk Maid"—Philip Jared.

See also his articles about the same family in the November issue, "The Book Worm Gets Milk on the Brain" and "Cry Baby Gets a Vitamin in Her Hair"—July, 1936.

Jan. 1937—"Microbes vs. Disease"—Milton Silverman. "Watch Your Diet"—
E. M. Geraghty. "Diabetes, Dogs, and Doctors"—Elliott Joslin.

Feb. 1937—"Diabetes, Dogs, and Doctors"—Elliott Joslin—Part II. "Dietary Advice of Francois Magendie." "Dieting Daughters."

Every issue contains interesting health education material.

Any articles in popular magazines written by the following nutrition authorities would be of interest—

Dr. Henry C. Sherman.

Dr. E. V. McCollum (conducts column in *McCall's Magazine*).

Dr. Walter Eddy (conducts column in *Good Housekeeping*).

Dr. Jean Bogert (conducts column in *National Parent-Teacher Magazine*).

Dr. Mary Swartz Rose.

Dr. Hazel Steibling—see Sept. 1937 *Woman's Home Companion*.

Dr. Lydia Roberts.

The American Medical Association has been conducting a series called "Drama by Radio—Your Health" over the National Broadcasting Company hook-up.

Send for *Facts, Fads, and Frauds in Nutrition* by Helen Mitchell and Gladys Cook—Massachusetts State College—Amherst.

Pamphlets from the Division of Child Hygiene, Massachusetts Department of Public Health, available to teachers.

For general references on other topics included in the Unit, see textbooks and references suggested for entire series of Units for Grade IX.

UNIT XIII

CONTROLLING OUR ACTIONS — THE NERVOUS SYSTEM

(Two to four periods.)

Objectives:

1. To appreciate the value of keeping the nervous system in good working order.
2. To learn how the nervous system is arranged.
3. To provide some simple understanding of how man may train his nervous system to work for his happiness and success.

Possible Approaches:

1. Compare the human body with an ocean liner which requires a captain to give commands and to keep all the parts in good working order.
2. Conduct class discussions of the ways in which the nervous system is like a telephone system. (Nerves—telephone wires—carry messages from all parts of the body to the brain and spinal cord—central office—and then back to various muscles, glands and other organs.)

Problem I

WHY DO WE NEED A NERVOUS SYSTEM?

Suggested Activities:

1. List six activities which are dependent upon the functioning of nerve cells. (Seeing, hearing, tasting, smelling, moving, thinking, having emotional feelings.)
2. Is every part of the body in contact with nerve fibers?

Problem II

HOW THE NERVOUS SYSTEM IS ARRANGED

Suggested Activities:

1. What happens when a message is received? Study the principle parts of the nervous system and their functions.
2. Draw a diagram which will include the three main parts of the nervous system—the brain, spinal cord and nerves. What is the main work of the brain? Of the spinal cord? How do we communicate with the outside world? What is a sensory nerve? What is a motor nerve?
3. Draw a diagram of a nerve cell and a nerve fiber attached to a nerve cell.
4. Discuss what happens when you put your finger on a hot stove.
5. Define a reflex action. Define a habit.
How does a reflex action assist in forming habits?
Is a baby born with habits?
How do habits (good and bad) affect you?
Does a $2\frac{1}{2}$ year old child have to think when he first starts to lace his shoes?
How does it become a habit?
6. Besides the nerve messengers in the body, what are the chemical messengers which assist the nervous system? Consult reference texts to find out the names of these glands of internal secretion.
7. What has the nervous system to do with memory?

Problem III

HOW CAN MAN TRAIN HIS NERVOUS SYSTEM TO WORK FOR HIM?

Suggested Activities:

1. List the things to remember when you begin to form good habits:
Lay the foundations for a new habit with a strong and decided start.
Never allow an exception to occur until a new habit is established.
Seize the first opportunity to put the resolve into action.
Practice using the new habit every day at every opportunity.
2. Does a person have mental and emotional habits as well as physical habits? Is worry a habit? Is losing your temper a habit? Is concentration a habit? Is there a relationship between mental and physical habits?
3. Each pupil may make a list in his workbook of at least 20 varied activities performed by him in one day. Next to each write whether it is a reflex, a habit or a conscious act. Name any acts that still are conscious but should be habitual. What interferes with their becoming habitual? In the same workbook, list the above habits under the most suitable divisions such as: physical, mental and emotional.

4. How does care of the nervous system compare with care of the body in general? (Very similar. Rest, outdoor exercise, good food, protection against infection.) Why is sleep so important? (Sleep is the body's repair time.) How much sleep is needed? Compare the body with a plane which is repaired during stops. What amount of sleep is needed by ninth graders? What is the effect of short rest periods, changes in activities, and hobbies?

5. What usually causes a "nervous breakdown"? (Overwork when worried, ill, tired or under unhygienic conditions.)

6. If a high school pupil wishes to cultivate the habit of politeness, state the steps he would have to take to establish the habit. If he wishes to break himself of the habit of interrupting other people's conversations, how would he go about it?

7. Write a short paragraph on the relationship of a good nervous system to success in life.

UNIT XIV

LEARNING ABOUT THE WORLD AROUND US— STUDY OF THE SENSE ORGANS

(Six to twelve periods.)

Objectives:

1. To discover how our eyes see the world around us, how our ears hear sounds around us; how we smell and taste things and how we feel things around us.
2. To care for the parts of our bodies which enable us to know about the world around us.

Possible Approaches:

1. Discuss in how many different ways your body learns what is going on outside of it.
2. Read or tell stories about the "Seeing Eyes." "Seeing Eyes" are the dogs who are trained to lead blind people.*
3. Conduct experiments on bone conduction of sound.

Set the stem end of a vibrating tuning fork on the top of your head or upon your teeth. Where does the sound seem to be located? Close one ear. Where does the sound seem to be located? Close both ears. Result? (The sound waves in this experiment are conveyed by the bones of the head to the lymph [liquid] of the ear and thus to the hair cells which are the receptors for hearing.) Set the vibrating fork on your teeth and when the sound is no longer audible quickly bring the fork to your ear. Which is better, bone or air conduction?

Fatigue of hearing: Sound a tuning fork and place it with the stem end upon your head. When no longer heard, quickly remove it, and a few seconds later replace it. The sound is heard again. Why?

4. Experiment with tasting with the nostrils tightly held. Cut pieces of apple and potato inside under the skin. Taste each with the nostrils held tightly together with one hand. Do they taste different?
5. Experiment with feeling with eyes closed. Try feeling of objects with the front and back of your hand. Do they feel the same?
6. Discuss methods of teaching the blind and the deaf. Obtain samples of Braille. Visit Perkins Institute for the Blind or some school for the blind, or give a report on this work. Read the "Story of My Life" by Helen Keller.

**Hygia*, August, 1935, Rose Henderson, "Trained Dogs Guide the Blind"; *News Week*, May 9, 1936; *Time*, May 18, 1936; *Literary Digest*, December 5, 1936.

Problem I

WHAT SENSE ORGAN IS SUBJECT TO THE GREATEST STRAIN?

Suggested Activities

1. Discuss the way in which the eye is like a camera. Look up in textbooks the various parts of the eye and its care. With a camera and, if possible, a model of the eye, make comparisons between the two. (Pupil or hole in the colored part of the eye lets light into the eye like the opening of diaphragm of the camera; the lens which focuses light on the retina of the eye or on the film of the camera.) What important differences are there between the two? (The retina is a black membrane with nerve endings which continuously report to the brain. The film makes one permanent record. The eye is more sensitive to color than the camera.)

2. How is it possible to get a clear picture on the film and on the retina? (In the camera, light rays are brought to a focus by varying the distance between the lens and the film; in the eye, focusing is brought about by accommodation of the lens, that is, by thickening or thinning the front of the lens, which is behind the pupil.)

3. Experiment with a magnifying glass to see that images on a piece of paper held behind the lens are reversed by the lens. How then do we see things in their right position? (Although the image on the retina is reversed, the brain interprets the messages so that we see things in their right position.)

4. Why is it restful to the normal eye to look at far objects and fatiguing to look at near objects? (For the normal eye there is no particular effort in accommodating in order to see far objects, but in looking at near objects muscles within the eye must contract to make the lens thicker in front and thus focus the light.)

5. Experiment to convince yourself that when near objects are clear, distant ones are indistinct. Stand near a window and look through a wire screen. Can you see both the screen and the houses across the street clearly at the same time?

6. Find out the meaning of: nearsightedness, farsightedness, astigmatism, color blindness.

7. How do glasses help people who need them? Study diagrams to see where images are brought to a focus in the normal eye; in the nearsighted eye; and in the farsighted eye.

8. What are some of the signs that a person needs to be examined for glasses? (Holding book continually less than twelve to fourteen inches from the eyes, frequent headaches after close work, blurred print, scowling or squinting at class work, difficulty in reading the blackboard, slowness and difficulty in studying.)

How can a high school student be sure whether or not he needs glasses? Who should fit them? Find out the difference between an oculist and an optometrist. Should "looks" be considered if one really needs glasses? What are the advantages of glasses to a person who really needs them? (Correct defects of the eye and of vision, preventing red, watery eyes, wrinkles, squinting and other signs of eyestrain.) Make posters of boys and girls wearing glasses which also illustrate attractive appearance.

9. Read or discuss the figures recorded in the annual vision test on pupils' physical record cards. What do these figures mean? Give a vision test to a pupil whose eyes have been recorded as 20/20. (This fraction represents normal vision; the normal eye can see at twenty feet the design-

nated figures on the eye chart.) Test the vision of pupils who, without glasses, have records of less than 20/20. How were their records determined? (If at twenty feet, a pupil can read only letters which the normal eye can see at forty feet, his vision is 20/40.) Test vision of a pupil whose vision has been corrected by glasses.

10. Name five protective agencies of the eye.

Eyebrows

Eyelashes

Tears

Muscle control

Bony structure

11. Make notes on ways in which your eyes have to work hard during one week.

12. Name the things which cause eyestrain. List the things one needs to do to keep the eyes in good condition for work by day and by night, for play, and for safe driving of automobiles.

13. What information can you gather about the effect of food (vitamin A) on the eyes?

14. Study regulations for preventing eye injuries in industry.

15. Report on the Red Cross first aid treatment for foreign bodies in the eye.

16. From the standpoint of vision, what should be the criteria for judging the printed or written page? (Paper of neutral tint, not glossy, black ink, print sufficiently large and letters grouped with word spacings sufficient in size, reading line not more than $4\frac{1}{2}$ inches in length, preferably shorter, so that not more than two or three points of fixation are necessary, all work to be 12 or 14 inches away from the eye.)

17. Survey the lighting facilities of the classroom.

Are the windows arranged so that light falls from the left side and back of all pupils?

Are the windows equipped with double shades which roll up and down from the middle of the sash?

Are the shades light or dark?

Are the artificial lights shaded so there is no glare?

Do desks and blackboards have a dull finish which prevents glare?

Are blackboards smooth and black so they can be read easily?

Obtain a foot candle meter from your local lighting company and find out whether pupils' desks at all times have 8 to 10 foot candles of light as recommended by the National Code of School Lighting.

18. Write to the National Society for the Prevention of Blindness, 50 West 50th Street, New York City, to find out what is done to conserve eyesight. Individual pupils may make reports of the investigation.

19. What are the important facts about lighting in the home with sunlight? What are some important facts to know about artificial lighting in the home? What are the important types of illumination in the home? Each pupil may write in his health workbook the conditions (what is his favorite place?) under which he reads at home.

Problem II

WHAT IS YOUR BEST RECEIVING SET? STUDY OF THE EAR.

Suggested Activities

1. Name five things which you learn through your sense of hearing.

2. Study the nature of sound. Correlate it with related learnings in general science as follows:

What is the cause of sound? For a demonstration lesson use the following procedure: Strike prongs of a tuning fork on a table and touch one of the prongs lightly to the water in a tumbler. (Saw blade may also be used.) Draw observations from above procedure.

What media transmits sound?

What variations are there in speeds of sound?

What are the properties of musical sounds and other noises and of the human voice?

What is the working of the radio?

3. Look up in textbooks the general structure of the ear. Examine the outer ear. Find out its function.

4. Consult reference books for a diagram of the ear which traces the course of sound waves which produce the sensation of hearing.

5. Consult reference texts to find out the function of the middle ear.

6. Where in the ear do the nerve impulses of hearing start? (Review the nature of the nervous system in order to understand the question.)

7. Find out the connection between the nose, throat and ears.

8. Why is it that a person does not more often lose his balance and fall? What causes seasickness?

9. Name some accidents which may happen to your ears. Name some foreign bodies which may get into the ears and how best they may be removed.

10. What is the cause of earache? Of mastoiditis? What is meant by sinus trouble? How may a bad cold affect the ears, nose and throat?

11. What two diseases are apt to cause deafness? (Scarlet fever and diphtheria.) How may they be prevented?

12. Do loud and harsh noises affect the ears? How?

13. Name three handicaps resulting from poor hearing.

14. What are warnings of ear trouble? (Feelings in the ear—dullness, heaviness, blocked feeling; pain or tenderness in the ear or near it; head noises—buzzing, ringing, etc.; running ear; asking to have words or sentences repeated. Little children are often inattentive, fail to answer, have tired facial expression, mispronounce words.)

15. What can we do to avoid ear trouble? (If you have earache, go to see a doctor, do not use home remedies; avoid colds; take care of yourself if you have a cold; avoid infectious diseases; protect your ear canals and eardrums from injury from without. Do not strike anyone on the ear, do not pull ears, do not poke things in the ear, have doctors remove hardened wax. [A small amount of wax is natural and keeps the eardrum from being injured.] Protect your ears when swimming.)

16. What can be done for people with ear trouble? (Place yourself under the care of a doctor, take lip-reading lessons, avoid getting too tired or being in unnecessary noises, rest and sleep in quiet places. Deaf people should not withdraw from friends but should go about and live normal lives. Use a hearing instrument if it is recommended by doctors and if it helps you; get in touch with organizations for the hard of hearing; do not become sensitive if you are deaf; try to help others to make you understand, but don't imagine that people are making fun of you.)

17. Discuss hearing tests given to pupils. If the school has audiometer tests, discuss this means of determining the acuteness of hearing. Can all hear sounds equally well? At equal distances, test (with the ticking of a watch) the hearing of sounds of equal strength on different pupils. Have pupils move until they do not hear the ticking. Compare distances.

Problem III

SMELLING AND TASTING

Suggested Activities

1. What do we learn about the things around us from smelling? (It helps us to taste the flavor or sense the odor of foods; it gives us pleasing sensations from fragrant refreshing odors of things around us; it warns us against smoke and fire, some poisonous gases, odors which might indicate harmful bacteria and molds.)

2. Find out why animals seem to depend more upon the sense of smell than human beings. (Sense of smell is very primitive and a very strong sense in some animals. Animals are aided by smell to sense approaching danger, in finding their way, in hunting for their masters. Man has other sense organs which help him do these things and so he has not developed his sense of smell.)

3. Consult health texts in order to obtain information regarding the structure and functions of the nose.

4. What can we do to keep a good sense of smell? (Avoid infection from colds which harm the olfactory organ, keep ourselves, our homes, our community healthy and wholesome—free from horrible odors, train our sense of smell so as to recognize certain odors, but do not let it emotionally overcome us so that we are supersensitive to smells.)

5. Consult health education texts in order to find out where the taste buds are located. (Refer to experiment suggested as one of the approaches to the unit.) What are the different kinds of tastes?

6. Is taste the best guide for us to use in selecting foods that are healthful?

7. Why do foods taste better when eaten slowly?

8. Why does holding your nose and swallowing medicine make it taste less?

9. What can we do to keep our sense of taste? (Avoid food that is too hot, too salty, too spicy; avoid the use of alcohol and tobacco; keep the teeth and mouth clean; train our sense of good taste.)

Problem IV

TOUCH

Suggested Activities

1. How do animals like cats feel their way through the dark? (By long hairs on the face.) Experiment to find out whether we can get feeling in this manner. Draw a thread along the middle finger from the last joint to the nail. Using the same finger, draw the thread from the first to the second joint. Where did you feel the thread? How do you account for this? (There are a considerable number of hairs on the skin between the first and second joints and at the side of each hair is a touch spot. The touch spots were not directly affected [stimulated] but when a hair was moved by the thread it came in contact with a touch spot.)

2. Are there touch spots where the thread was not felt? (Yes, but the pressure of the thread was not great enough to affect them. There are touch spots all over the body. The palms of the hands and soles of the feet have more proportionately than the rest of the body.)

3. What really then, strictly speaking, is the sense of touch? (Pressure.)

4. What are touch spots? (The ends of nerve fibers.)

5. What can we tell about the world around us by this sense of pressure? (Size, shape, location, smoothness, hardness, and dampness of objects.)

6. Why does a mother sprinkle bath water on her wrist or put her elbow in the water before putting the baby in the water? (These parts of the body are more sensitive to heat and cold although the fingers can judge temperature better.)

7. Experiment to determine whether feelings of heat and cold are conveyed by the same areas of the skin. With a wire hairpin which has been cooled in water, explore a region on the back of the hand a half inch square. Plot the points which feel cold. Heat the wire in hot water, and on the same area plot the warm points. (Separate points, called heat spots and cold spots, give us feelings of heat and cold. They are the ends of nerve fibers.)

8. Experiment to find out if touch (pressure) and pain are the same sensation. Moisten an area on the back of the hand with warm water until the skin is soft. Keep it moist. With a soft pencil outline a half inch square. With a sharp needle explore this area point by point but do not break the skin. Is there any difference in the feelings of pain and pressure at different points? (There are pain spots in the skin which are more sensitive than other points. It is believed these pain points are free endings of nerve fibers which lie nearer the surface of the skin than do the nerves of touch, heat, and cold.)

UNIT XV

BODY MECHANICS

(Four to eight periods.)

Objectives:

1. To create a desire to study more about how the human body is made and how it works so that the reasons for daily hygienic living may be better understood.
2. To improve the practicing of daily health habits by giving more knowledge and insight into "the whys."
3. To increase the knowledge and appreciation of the relationship of food to the building of strong bones during childhood.
4. To review and increase appreciation of the significance of good posture.

Possible Approach:

Oral questions for discussion, or for review of the knowledge which forms background for this unit.

1. How can the bones of the body be compared with the steel framework of a building? (A discussion of the skeletal system reveals

the many comparisons which may be made between the bones of the body and the framework of a large building.)

2. Discuss the value of good posture to personal appearance.

Problem I.

HOW DO THE BONES GIVE THE BODY FORM AND SUPPORT?

Suggested Activities:

1. List the main divisions of the skeleton as follows:

Head:

Skull

Cheek bones

Nasal bones

Jaw bones

Trunk:

Spine

Sternum

Ribs

Collar bone

Shoulder blades

Hip bones

Appendages:

Arms

Hands

Legs

Feet

2. Consult reference texts to find answers to the following questions:

What is the advantage of having over 200 bones in the body?

Why do bones differ in shape?

Reconsider the classification of the bones of the body you have just discussed in order to determine which:

a. Give support and shape to the body.

b. Give protection to the body.

c. Make possible the movements of the body.

Which bones have all three of these functions?

3. Collect from the butcher as many types of bones as possible. These may be used to illustrate the various types of bones found in the human body and to show the actual way in which the bones are jointed.*

4. The films, "Posture" or "The Body Framework," may be shown in order to secure a truer conception of the body framework.

5. Consult reference texts to find answers to the following questions:

How are the bones joined?

What are the three types of joints?

What would be the disadvantage in having a ball and socket joint at the wrist?

What happens to a joint when it is "sprained"?

6. Examine the collection of bones secured from the butcher shop in order to determine the way in which the bones are jointed to form the three types of joints:

a. Hinge: Example—elbow and knee

b. Ball and socket: Example—shoulder and hip

c. Gliding: Example—wrist and ankle

7. The ligaments of one of the bones at a joint are examined and they are found to be tough cords which hold the bones together. When a violent twist injures these ligaments a "sprain" occurs.

*It might be worth while to have the class visit a museum where a skeleton may be seen.

Problem II

HOW CAN BOYS AND GIRLS BUILD STRONGER BONES?

Suggested Activities:

1. Discuss the following questions:
 Of what materials are the bones made?
 Why do the bones of an older person break more easily than those of a child?
 Why does a young child creep before it walks?
2. Experiment 1: To learn the function calcium serves in the bones.
 Material: Small chicken bone.
 Small amount 5% hydrochloric acid.
 Beaker.
 Method: Select a small chicken bone, place it in a beaker and cover with 5% hydrochloric acid. Allow this to stand for several days and note the results in the next lesson.
3. Experiment 2: To show the deficiency in the structure of the bone when calcium is removed.
 Material: Chicken bone.
 Burner.
 Ring stand.
 Wire gauze mat.
 Matches.
 Method: Place a chicken bone over a slow fire and heat for several hours. Examine the results of this experiment in the next lesson.
4. What is the name of the disease caused by soft bones?
5. Discuss the effect of foods and sunshine as builders of calcium in the bones of growing boys and girls.

Make a list of the special foods rich in calcium. (Foods will receive further study under the unit on "Food Needs of the Body.")

6. Discuss "How is it possible for the long bones of the body to support such a large amount of weight in proportion to their size"?
7. Experiment 3: To learn the advantage of having most of the long bones of the body hollow and cylindrical in shape.
 Material: 2 sheets of paper $8\frac{1}{2}$ " x 11".
 2 paper clips.
 1 book.
 Method: Fold one sheet of paper longitudinally as many times as you wish. Try to support the book on this.
 Roll the other sheet of paper into a cylinder about an inch in diameter. Clip the edges to hold it together. Try to support the book on this.
 The advantage of the hollow cylinder lies in the fact that it can support more weight than any other structure of its size and weight.
 (For further study, the following project may be developed—look up in textbook a diagram giving the cross section of a bone. Examine under a microscope prepared slides which show the cross section of bones. Notice the hollow spaces which were, in life, the living cells and the surrounding bone which was deposited by them.)

Problem III

WHAT IS THE RELATION OF POSTURE TO A FINE BODY FRAME?

Suggested Activities:

1. Discuss the following questions:
 How do habits of good posture help to make a fine body frame?
 Why does your appearance depend upon your body framework and the way in which you use it?
2. Secure a picture which shows good posture and one which exemplifies poor posture. List the advantages suggested by the example of good posture:
 - a. Strength.
 - b. Peace of mind.
 - c. Power.
 - d. Self-confidence.

3. Discuss the relationship between posture and good feet. An illustration of a correct foot is examined in order to learn that there should be a space between the floor and the long arch of the foot. Other important facts regarding the foot are noted.

Footprints of each child are taken in the following manner:

Footprints

Materials: 2 stamp pads (6" x 12")
 Mimeograph paper
 3 drams 3% mercurochrome solution
 16 drams glycerine
 8 drams water

Method Moisten the pads with the above solution. Each pupil will place his weight, one bare foot at a time, on the pad. Transfer each foot onto the mimeograph paper. Place name and date on these papers.
 (As an important problem of integration with other departments, it is an advantage to have the physical education supervisor come into the classroom and assist in the presentation of all projects concerning posture and good feet. For this reason, it is suggested that professional cooperation be sought and that the footprints be made by the physical education department.)

4. Secure charts or models which illustrate the good and bad features of posture. Emphasize the following points:

Right standing posture:

Head up.
 Chin in.
 Chest raised.
 Back straight.
 Abdomen drawn in.
 Knees straight.
 Feet together.

Wrong standing posture:

Head dropped forward.
 Chin down.
 Chest sunken.
 Abdomen sticks out.
 Knees sag forward.

5. With the aid of reference books and through trying various exercises, decide which set of muscles are the most important in maintaining good posture. Consult the physical education department and learn three exercises which will strengthen the abdominal muscles. (These are the muscles which help to hold the backbone erect.)

6. Review the fact that the best sitting posture is with the hips against the back of the chair and the feet flat on the floor. How have factory owners recognized the value of well-adjusted seats?

7. Examine the footprints which were made previously. Select one which shows a good arch and with the aid of reference books learn the formation of this foot. What happens when the arch is broken? Discuss how this condition may be corrected by exercise and the use of correct shoes. (If it is possible, have the physical education department make posture silhouettes of each pupil. These may be referred to as the subject of posture is continued in the next Unit under the topic of muscular development.)

8. Show the Film "Feet," which is loaned by the Division of Child Hygiene, Massachusetts Department of Public Health.

UNIT XVI

THE BODY REGULATORS — THE ENDOCRINE GLANDS

(Two to four periods.)

I. Objectives:

1. To learn why people grow to be a certain size.
2. To learn why some people reach sizes which are far above or below the average.
3. To discover what endocrine glands are and what they do.
4. To find out what is meant by internal secretions.
5. To learn in what other ways besides growth these glands affect the body.

II. Approach:

It is suggested that the following pretest be given to the pupils before beginning the study of endocrine glands.

A. Pretest

In the blank spaces provided at the end of each statement indicate whether you believe the statement to be correct or not by writing the word TRUE or FALSE:

1. Circus giants and very fat people become so because they eat too much.....
2. Glands are organs that take certain substances from the blood and make them into new substances.....
3. Some glands create substances that have a direct effect on our behavior.....
4. Small amounts of iodine in the body are necessary to proper growth.....
5. The tonsils are glands which produce digestive juices.....
6. All glands make substances which are poured into the blood stream.....
7. The extra strength we get in time of emergency comes from the substance made by a body gland.....

8. The glands which supply digestive juices are the only ones of any importance
9. Some glands produce substances which regulate the activities of other glands
10. Endocrine glands is another name for sweat glands

NOTE: The following is a brief outline of the Unit on endocrine glands.

1. Pretest: Of the true-false type. Should be used only to discover what, if anything, the pupils already know about these organs.
2. Experiment and discussion:
To develop interest in the study, and to form a starting point for its further development.
3. Characteristics of glands:
General; leading up to specific study of endocrines.
4. The Endocrines:
 - a. Thyroid: location, function, abnormalities.
 - b. Thymus: same.
 - c. Pineal: same.
 - d. Pituitary: same.
 - e. Adrenals: same.
 - f. Parathyroids: same.
 - g. Pancreas: same.
 - h. Spleen: same.

B. Experiment and discussion.

1. Find the average pulse rate of the class at rest.
2. Find the pulse rate after excitement such as fright, anger.
3. Discuss feelings immediately following realization of danger, or passing of "hair-raising" incident.
4. Get pupils' ideas on why some people are giants and others dwarfs.

III. Suggested Activities:

1. Characteristics of glands. What is a gland? (An organ which takes substances from the blood, changes them into other substances for further use in the body or for excretion.) Name the two types of glands. (Duct and ductless.) What is another name for the ductless? (Endocrines, which means briefly—"to separate within"—from the Greek.) Name some duct glands (salivary, tear, sweat.) (Explain that since endocrines have no ducts their secretions must pass directly into the blood.) What are hormones? (Substances secreted by endocrines; sometimes called chemical messengers.) Name the endocrines. (Thyroid, thymus, pineal, pituitary, adrenals, parathyroids, pancreas, spleen.)

2. The endocrines:

a. Thyroid Gland:

Locate (at the top of and in front of the windpipe). What is its work? (Stimulates development of the brain and bodily growth.) What is its hormone called? (Thyroxin.) What is its effect? (Stimulates the cells to take in iodine—which stimulates growth and the oxidation of food.) What happens when thyroid fails to act? (Failure of mental and physical growth—cretinism.) What happens when this gland is overactive? (Life processes go along too rapidly; restlessness, excitability, large appetite.) Discuss goiter (enlarged thyroid).

b. Thymus Gland:

Locate (in chest behind the breast bone). What is the work of this gland? (Acts as brake or check upon the thyroid—prevents child from growing too fast—prolongs childhood.) Is this gland active throughout life? (No, it becomes smaller after full growth is reached and apparently has no further use.)

c. Pineal Gland:

Locate (near the center of the brain—very tiny). What is its duty? (Keeps child from growing too fast—apparently needed in addition to the thymus.) What happens if it is injured or removed? (Child goes through whole life cycle in a few years—dies at very early age.)

d. The Pituitary:

Locate (back of the nose above the roof of the mouth). Note that it is so important that nature has provided it with a special pocket. What are its two parts? (Anterior and posterior.) What is the work of the anterior hormone? (Stimulates growth of bone and connective tissue.) If this part of the gland is diseased what happens? (If it becomes too large the person may become a giant; if too small he may be dwarfed.) What is the work of the posterior hormone? (Stimulates rhythmic contraction of involuntary muscles; helps maintain salt ratio of body; possibly helps produce sleep.) Note that while the thyroid speeds up energy production the pituitary speeds up energy expenditure.

e. The Adrenals:

Locate. (They are two in number and are located on the top of the two kidneys.) What are they sometimes called? (Glands of "emergency energy.") What is their hormone? (Adrenalin.) What is the normal amount in the blood? (One part in 20 million.) Under what conditions is an increased supply of adrenalin poured into the blood stream? (Nervous stimulus such as rage or fear.) What then happens? (Liver releases liver sugar [glycogen] into blood stream; this provides quick fuel for the muscles.) Explain that this is the thing that sometimes happens enabling invalids to get out of burning houses, and weak men to battle those who are much stronger, etc.

f. The Parathyroids:

Locate (four tiny glands lying upon the thyroid). What is their duty? (Help to bind lime in the bones.) What happens if they are injured? (Softening of the bones, loss of hair, and death.)

g. The Pancreas:

Locate (back of the stomach). What does it do? (Secretes digestive fluids which are poured into the intestines.) What else does it do? (Secretes a hormone called insulin.) What is the work of this hormone? (It acts as a brake upon the liver, preventing the release of too much sugar into the blood.) What happens when this hormone is not secreted? (A disease known as diabetes is caused.) Where in the pancreas is insulin secreted? (Gland cells called Islands of Langerhans.)

h. The Spleen:

Locate (in the abdominal cavity about level with the lower left rib). What is its duty? (Stores red corpuscles.) Why is it listed as an endocrine? It is not certain just what this gland does, but there is every indication that it has some important function. The same may be said of many of the other body glands.

IV. Additional Pupil Activities:

1. Prepare diagram showing the location of the endocrine glands in the body. Show the approximate shape and size of these glands.

2. Prepare diagrams showing both a duct and a ductless gland for purposes of comparison.

3. Collect pictures of freaks and write composition showing how their condition may have been caused by disorders of the ductless glands.

4. Prepare compositions telling of the work of men who have made great contributions to our knowledge of the endocrines, and to the conquest of disease caused by disorders of these glands. (Refer particularly to books written by Paul De Kruif.)

5. Prepare compositions showing how these glands affect our behavior.

UNIT XVII
HARMFUL SUBSTANCES

3-6 periods

(See material suggested on this topic in separate bulletin, published by the Massachusetts Department of Education.)

UNIT XVIII

SAFETY

3-6 periods

(See special bulletin available from the Massachusetts Department of Education.)

The Commonwealth of Massachusetts

SUGGESTED TEACHING UNITS IN HOME NURSING AND CHILD CARE FOR GIRLS FOR THE JUNIOR HIGH SCHOOL

MASSACHUSETTS COURSE OF STUDY IN HEALTH EDUCATION

Bulletin No. 4 ✓

1941



ISSUED JOINTLY BY
MASSACHUSETTS DEPARTMENT OF EDUCATION
AND
MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
BOSTON, MASSACHUSETTS

FOREWORD

A committee has been organized for some years for the purpose of establishing outlines in health. This committee was originally sponsored in the Massachusetts Department of Education in 1932 by Frank Purinton Morse, then Supervisor of Secondary Education.

A mimeographed report was issued for purposes of trial in certain interested school systems. About three years ago, it was definitely decided that the immediate task was to establish these outlines for the use of grades seven, eight, and nine, and to defer the preparation of outlines for the upper grades to a later date.

A second report was mimeographed and used for experimental purposes in certain schools in 1936-37.

The following bulletin is one of five which has been prepared by the committee. The Massachusetts Department of Education is pleased to cooperate with the Massachusetts Department of Public Health in the issuance of these bulletins. I wish to thank all concerned, and particularly the committee whose names are herein listed, who have made the work possible.

WALTER F. DOWNEY,
Commissioner of Education.

The Massachusetts Department of Public Health, realizing that the school health education program is an integral part of preventive medicine and the public health program, is especially pleased to cooperate with the Massachusetts Department of Education in the publication of a guide for the teaching of health in the junior high school. It is the duty of the public health profession to inform the educational profession as to the thoughts and actions which they wish the citizens of the community to have regarding their health. The co-operation of the public health profession with the teaching profession is indeed a powerful alliance and one which is going to make it possible to bring closer to realization our goal, a people free of preventable illness and defects.

PAUL J. JAKMAUH, M. D.
Commissioner of Public Health.

COMMITTEE ON HEALTH EDUCATION IN THE SECONDARY SCHOOLS

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INTRODUCTORY NOTE TO TEACHERS

The Committee on Health Education in the Secondary Schools was appointed by the Department of Education. This committee set up the general plan. Individual members prepared teaching units on the respective topics. These units were revised upon the basis of suggestions from other members of the Committee. The revised units were mimeographed and placed in the hands of a limited number of junior high school teachers whose suggestions and criticisms were considered in making the later revision.

For the purpose of still more effectively adapting the material to the age levels for which it was prepared, subcommittees of junior high school teachers and administrators examined and further revised various units which were then turned over to a small editing committee.

The work of this committee represents a voluntary time contribution on the part of committee members who were already carrying a full schedule of professional work. This fact and the experimental use of the present units explains why the units themselves have not all been put into similar form. The teacher is referred to the separate bulletin on *Suggestions to School Administrators for Health Teaching in Junior High Schools* for a consideration of the general plan.

The units are planned to follow an adequate program of health instruction in the elementary schools. This program of study proposes the teaching of *Community Health* in Grade VII; *Physiology as Applied to Daily Living* in Grade VIII; also *Physiology as Applied to Daily Living* for the first half of the school year for Grade IX. It proposes the teaching of *Home Nursing and Child Care for Girls* and *First Aid for Boys* in the last half of the ninth year. Both teacher and pupil references are included in connection with the units to be taught.

This is a tentative outline, for a later revision of which, your suggestions are desired concerning grade placement, interest, other possible experiments, activities, demonstrations, references, and visual material.

The units on *Home Nursing and Child Care* require about 30 lessons. The use of double periods is necessary because of the practical work. Class enrollment should be limited to 20 pupils. A more desirable number is 16. These units presuppose the earlier instruction in hygiene and physiology recommended by the Massachusetts Department of Education. Standard textbooks (see references) are recommended for use with these units.

LIST OF UNITS

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UNIT I

WHAT A HIGH SCHOOL GIRL SHOULD BE ABLE TO DO, IN ORDER TO BE HELPFUL WHEN THERE IS SICKNESS OR AN ACCIDENT IN THE HOME*(Approximately 8 lessons)***Objectives:**

1. To gain additional appreciation for the necessity for teamwork in a family.
2. To arouse appreciation towards the home care of the sick.
3. To learn through reading, discussion, demonstration, and practice, some of the skills which will make it possible to make a patient in bed more comfortable.
4. To appreciate the need for medical care, nursing service, and hospital care for very sick patients.

Approach:

What would you consider your responsibility toward a member of your family sick at home?

Suggested Teaching Procedures:

1. Discuss the need for teamwork in sport, school, and the home. How does this apply to sickness in the family?
2. Discuss with the class the following question: if you were ill enough to be in bed for a few days, what kind of room would you like best? Why is cleanliness especially important? Why is simplicity desirable?
3. List the important things to consider in selecting a temporary sickroom. What is mental rest? Why is it equally as important as physical relaxation? Write one-page paragraphs on what you would do to make the patient's room as attractive as possible.
4. Consult reference texts to find out the kind of bed most satisfactory for a sick person. Learn through demonstration how to make a bed.
5. Why are light and sunshine essential to the sickroom? What four things are to be considered in ventilating a room? Review with the class facts already learned regarding adequate ventilation.
6. Describe several ways of protecting a patient from drafts.
7. What is usually the desired temperature for a sickroom?
8. Start a class scrapbook to which you can add material throughout the year. (A loose-leaf book is most convenient.) Let your first pages illustrate:
 - a. a bedroom which is suitable to use as a sickroom.
 - b. various appliances to use in ventilating the room.
9. If your classroom or school has the equipment, arrange a sickroom.
10. Arrange a bedside table for the convenience of the patient.
11. Draw a floor plan of your room, and show what changes, if any, would be desirable if it were to be used as a sickroom.
12. Develop by discussion and demonstration, a project on "Baths and Making Occupied Beds."
13. Were you ever sick in bed? Did you find it restful to change your position often? How did you feel after having a bath? Did the weight of bedclothes tire your feet and legs? Have you ever used a back rest?
14. What does the word "routine" mean to you? What are the advantages of working in a routine way? What things do you consider when you are planning a daily program? Why are such methods especially

- important in taking care of the sick? Consult textbooks to find what factors are to be considered in making out a daily program.
15. What are the duties of an attendant? How should she dress? What are her responsibilities? Why should she respect the privacy of her patient? Why is it important to keep a record of what you do for the patient, and what you notice in regard to his condition? Have each pupil prepare an illustrative daily (24-hour) record sheet. What are the qualifications for being a good nurse? Would you be interested in being a nurse? Why? Why should every homemaker have a course in home nursing? What care do the hospitals give which you could not give?
 16. Consult reference texts in order to be able to discuss the following questions:
 1. Before breakfast routine
 2. Morning care
 3. Evening care
 4. Night care.
 17. Demonstrate how to give a bedpan—how to prepare a patient for breakfast—how to give evening care.
 18. Consider in some detail the problems of convalescence. Why does the convalescent have mental problems? What would you do to help? What is occupational therapy? Name several kinds of occupations used. What things would you consider in selecting an occupation for a patient?
 19. What is meant by a "chronic patient?" What things should be especially considered in caring for such a patient? Have you an aged relative in your home? Demonstrate how to get a patient up into a chair.

Desirable Outcomes:

1. Skill in making unoccupied bed.
2. Skill in making occupied bed.
3. Learning necessity of being observant in sick room so as to be able to care for patient's needs without superfluous attention.

UNIT II

WHAT A HIGH SCHOOL GIRL SHOULD KNOW ABOUT THE SIGNS OF ILLNESS AND MEETING HOUSEHOLD EMERGENCIES

(Approximately 8 lessons)

Objectives:

1. To develop some understanding relative to the ways illness begins.
2. To develop some judgement regarding the type of symptoms which should necessitate calling the family physician.
3. To learn how to take temperatures. To learn the care and administration of simple household medicines.
4. To appreciate the dangers of lay diagnosis and the uses of patent medicines.
5. To learn some first-aid skills in meeting emergencies.

Approach:

What signs or symptoms in a younger brother would tend to make you think he was not well?

Suggested Teaching Procedures:

1. Review briefly with the class the causes of illness.
 1. Faulty working of the body organs.
 2. Infections and infectious diseases.
 3. Accidents and mental conflict.
2. Review also four important procedures for keeping well.
 1. The development of healthful habits of living in everyday life.
 2. Regular physical examination, health advice, and treatment by physicians.
 3. Immunization against certain diseases.
 4. The maintenance of healthful living conditions.
3. Can you tell anything about a person's health by his general appearance? Do you know some of the signs of health? List these with the class. Is illness expressed in one's appearance and behavior? How?
4. Do you know how to take a temperature? Read a thermometer? Care for a thermometer? What is meant by the word "symptom?" Why should everybody be able to recognize the general signs of illness? (Point out the danger of lay diagnosis.)
5. Consult reference texts for lists of the most important symptoms. What is meant by objective symptoms? Subjective symptoms?
6. Develop discussions and demonstrations for establishing familiarity and skill in rendering treatments to a sick person.
7. What is the proper way of filling a hot water bottle? When is it safe to use a hot water bottle and when should it not be used? How should it be cared for after being used?
8. What important parts do diet, baths, rest, exercise, and other hygienic measures play in the prevention and correction of sickness?
9. Discuss with the class the rules to apply in the taking of drugs. Point out the danger of self-medication and the use of patent medicines.
10. Consult reference texts to learn what medicines should be included in the household medicine cabinet. Each girl may consult with her mother and plan a cabinet for her family and report on this in class. Let the girls agree on a list of the proper patent medicines to be used in the home. Stress the special attention needed in the case of poisons, drugs, and the disposal of unused medicines.
11. Develop simple first-aid demonstrations concerning bandaging, sprains, strains, lifting an injured person, and artificial respiration.
12. Discuss the general principles to be remembered in treating emergencies.
13. Discuss the cause of fainting. Demonstrate the method of preventing fainting. Demonstrate the method of reviving a person who has fainted.
14. Demonstrate how to treat and bandage a burn. How does the treatment differ as to the kind of burn?
15. Have the class consult reference texts to find out what to do in the case of sunstroke, and what to do in the case of heat prostration.
16. Have each member of the class get together a "first-aid kit." Find out what Girl Scouts have to know concerning first aid.
17. What should be done for a patient having a convulsion?
18. What is the treatment of poison ivy?
19. What should you do to stop a nosebleed?
20. What causes an infection? What is a wound? Why should any wound be cared for at once? Why would you allow a deep wound to bleed rather freely for a few minutes? Tell how to treat a dirty wound. Name some useful antiseptics for the home medicine cabinet. Tell how to treat an infected wound. Carry out the activities as suggested by Turner, Morgan and Collins, page 137. (See reference list on page 11 of outline.)

Possible Outcomes:

1. Ability to recognize symptoms of illness.
2. Skill in reading thermometer, and proper care of thermometer.
3. Skill in filling hot water bottle, and its proper care.
4. Skill in dressing a wound and in applying bandage to keep dressing in place.

UNIT III**HOW SHOULD YOU CHOOSE AND PREPARE FOOD FOR ONE WHO IS ILL?***(Approximately 3 lessons)***Objectives:**

1. To develop interest in applying acquired knowledge and skills in cookery to the problem of feeding the sick.

Approach:

If you were ill how would you like your food served? Would you care about having the tray look attractive?

Suggested Teaching Procedures:

1. Review with the class the facts regarding food and nutrition learned in general health instruction and in the home economics department.
2. What part does food play in keeping well? In recovering from illness?
3. What effect does the mental attitude have on the digestive process? How would an understanding of this aid in feeding the sick? Name the four classes of diet for the sick and give several articles under each.
Why is constipation a common ailment among patients confined to bed?
What attempts should be made to overcome it by diet?
Why is it necessary for sick persons to drink water freely, and what efforts should the attendant make to encourage them to do so?
How would you serve a tray to a sick person to make it most attractive?
How may a helpless person be aided in eating?
Prepare and serve a tray for a sick person.
4. Let each girl make out menus which are especially adapted for feeding the sick. Plan a soft diet for a patient for a week and describe how you would serve it. If mother should be on a light diet, plan a day's meals for her.

Desirable Outcomes:

1. Ability to prepare and set up an attractive tray.
2. To know how to aid a helpless person to eat.
3. To know the four classes of diet for the sick.

UNIT IV**WHAT SHOULD A HIGH SCHOOL GIRL UNDERSTAND ABOUT THE CONTROL OF COMMUNICABLE DISEASES IN THE HOME?***(Approximately 3 lessons)***Objectives:**

1. To review with the class the facts learned in general health education regarding communicable diseases and how they may be prevented.

2. To learn what is meant by "immunization."
3. To apply the information to the special problems of the home care of the sick.
4. To arouse an additional appreciation towards the social responsibility for preventing colds.
5. To gain understanding as to why an open case of tuberculosis should not be nursed at home.

Suggested Teaching Procedures:

1. Discuss what is meant by saying that a certain disease is "catching." Review information obtained from health instruction in grades 7 and 8 regarding communicable diseases.
2. Have each girl look up subject matter regarding immunization.
3. Make a list of the things you can do to keep from catching a communicable disease.
4. Investigate what your local Board of Health is doing for the control of communicable diseases. Name two diseases that could be completely wiped out by immunization.
5. Assign as a class problem for investigation, the truth or fallacy in the statement, "Children should have the common diseases early and get them over."
6. Suggest how you would plan a campaign for having all the children in your community immunized against diphtheria.
7. Make posters which may be of use to the Board of Health in its educational program.
8. Discuss the fallacy in the statement, "The poison in the serum for inoculation, placed in the blood, may cause a person much trouble later."
9. Select a room in your house which you would choose for an isolated patient, and make a list of the changes you would make in preparing the room for the patient.
10. Demonstrate how to use an apron when caring for an isolated patient.
11. Demonstrate how to remove linen from the isolated room.
12. Why is isolation necessary in the case of communicable disease?
13. List the various ways in which communicable diseases are transmitted.
14. What is meant by incubation period?
15. What are the dangers of the common cold?
16. If you had a bad cold, describe in detail how you would avoid giving it to the other members of your family.
17. Outline the special precautions to take in caring for patients with communicable diseases.
18. What measures are necessary to isolate a patient who is suffering from a communicable disease?
19. Outline the means of disinfection to be used.
20. What is meant by quarantine?
21. What is the danger of caring for tuberculosis in the home?
22. What are likely to be some of the ill effects from having some of the so-called "common" children's diseases? How may they be prevented?
23. Give a simple method of disinfecting:
 1. Nose and throat discharges
 2. Bowel and bladder discharges
 3. Bath water
 4. The hands
 5. Dishes and utensils
 6. Linen.
24. What care should be taken at the termination of isolation?
25. Make a list of common communicable diseases and state the precautions necessary to prevent them. Which of the precautions should be taken by the individual, and which by the community?

Desirable Outcomes:

1. A knowledge of the cause of communicable diseases.
2. Further appreciation of the efforts of public health authorities to control communicable diseases by immunization.
3. Increased understandings of the probably serious after effects of having one of the so-called "common" children's diseases.
4. Some skills in the home care of the common communicable diseases.

UNIT V

WHAT A HIGH SCHOOL GIRL SHOULD KNOW IN ORDER TO HELP WITH THE CARE OF YOUNGER CHILDREN IN THE HOME

(Approximately 10 lessons)

Objectives:

1. To develop a sympathetic understanding and appreciation of little children, and a sense of true responsibility towards them.
2. To enable a girl to give more intelligent assistance in the care of young children in her home, or wherever such help is required of her.

Suggested Teaching Procedures:

1. What has every child a right to expect from his environment?
2. How can you help children to be healthy and happy? How can you appreciate mother's problems in teaching the children regular habits?
3. How early should habit training begin? What is meant by routine? Consult reference texts in order to work out a schedule for a young baby. Have girls observe babies in their own families over week end and report on how each baby "spent the day." Suggest improvements.
4. How can you help mother bathe the baby? Develop a project in connection with the baby's bath.
5. Discuss the advantages of keeping a baby under the care of a good pediatrician.
6. Where can reliable literature in regard to children be secured? What are Well Child Conferences? (Inquire of your local Board of Health or State Department of Public Health.)
7. Why is regularity so important in carrying out the baby's daily routine?
8. How often should a baby be weighed? How is he prepared? When is the best time for weighing?
9. How would you treat cradle cap?
10. What is the surest means of preventing rash on the buttocks?
11. How should the diapers be cared for? How should they be washed?
12. Why is exposure to direct sunlight so essential during babyhood?
13. How would you prepare a baby for a sunbath? How long would you expose him? *Infant Care*, Publication No. 8, Children's Bureau, United States Department of Labor, pp. 42-47.
14. Discuss the ventilation of a baby's room.
15. Describe the exercise period. How should the creeping baby be given a free exercise period?
16. Discuss the methods of training a baby to sleep regularly.
17. Why should the baby be protected from the thumb-sucking habit?
18. What is the ideal food for the baby?
19. What is the usual feeding schedule for a new-born baby? A three-months-old baby?

20. Describe the methods of determining whether or not a baby is getting enough food.
21. How is a baby weighed before and immediately after a feeding. Why is this done?
22. What is meant by supplementary feeding? When is it given?
23. What is the best substitute for mother's milk? What kind of milk should one buy for a formula?
24. How should the utensils used in making a formula be cared for?
25. Describe the proper care of bottles. Of nipples.
26. Describe the method of preparing a formula.
27. How should a bottle be given to a baby?
28. What should be done to help a baby raise the air which he swallows during a feeding?
29. How often does a baby require water? How is it prepared?
30. Why is water given to the newborn baby?
31. Why is orange juice given to babies? How and when is it given?
32. Why is cod liver oil, or some other fish liver oil, given to babies?
33. What causes colic? How may it be relieved?
34. Add to your scrapbook any material suggested by this Unit.
35. If you have scales in your classroom, demonstrate how to weigh a baby before and after a feeding.
36. Prepare a formula. (Perhaps you can actually help an older sister or a friend prepare a formula for her baby.)
37. Demonstrate the method of giving a bottle to a baby.
38. Demonstrate the method of giving an enema to a baby.
39. The teacher may give special credit to girls who care for babies outside of school hours.
40. In what period of life is development most rapid? Who teaches the baby during this period?
41. How does the baby learn? What natural tendencies can be made of use in guiding his education?
42. How does a child become efficient with his hands? How does he learn to speak correctly?
43. Why does the runabout child need the companionship of children his own age?
44. What attitudes of the mother toward the child are particularly important? In teaching him, what points should she stress?
45. When are character traits and mental habits established?
46. Discuss the important points in feeding the runabout child.
47. How should a child be supplied with the sugar he needs? What are the dangers of giving sweets?
48. Why is it important to see that the temporary teeth are well cared for? Of what should this care consist?
49. How much sleep and rest does the preschool child need? Why?
50. What are the important points to remember about the illnesses of childhood?
51. How may the runabout child be protected from colds?
52. Add to your scrapbook pictures showing the normal activities of the preschool child.
53. Make posters showing the feeding schedule and a one-day menu for the two-year-old child. For the three-year-old child.

Desirable Outcomes:

1. A beginning knowledge and appreciation of child growth and development as it pertains to the whole child.
2. A realization of the close relationship of the mental, emotional and physical aspects of child life.
3. A desire to be more understanding in dealing with younger brothers and sisters.

BIBLIOGRAPHY

Growth and Development

- RAND, SWEENEY & VINCENT: *Growth and Development of the Young Child*. Saunders. 1940.
 KUGELMASS: *Growing Superior Children*. Appleton-Century. 1936.
 STUART: *Healthy Childhood*. Putnam. 1933.
 SMITH: *Baby's First Two Years*. Houghton Mifflin. 1937.
 BARTLETT: *Infants and Children*. Farrar & Rinehart. 1932.

Nutritional Needs of Childhood

- ROBERTS: *Nutrition Work with Children*. University of Chicago Press. 1935.
 ROSE: *Feeding the Family*. Macmillan. 1940.
 BOGERT: *Nutrition and Physical Fitness*. Saunders. 1932.
 ALDRICH: *The Prevention of Poor Appetite in Children*. National Committee for Mental Hygiene, New York, N. Y.
 HOLT: *The Care and Feeding of Children*. Appleton-Century. 1935.
 LOWENBERG: *Food for the Young Child*. Collegiate Press, Ames, Iowa. 1934.

Physical Routine and Care of the Child

- KENYON: *Healthy Babies Are Happy Babies*. Little, Brown. 1934.
 ALDRICH: *Cultivating the Child's Appetite*. Macmillan. 1936.
 BLATZ & BOTT: *The Management of Young Children*. Morrow. 1930.
 FOSTER: *Busy Childhood*. Appleton-Century. 1933.
 TISDALE: *The Home Care of the Infant and Child*. Morrow.
 ROGERS: *Is Your Child Ready for School?* Publication No. 19, Bureau of Education, Washington, D. C. (Pamphlet.) 1926.
The Child from One to Six. Publication No. 30, Children's Bureau, Washington, D. C. (Pamphlet.) 1937.
Federal and State Booklets on Care of Infant and Preschool Child.

The Mental Hygiene of Childhood

- ANDERSON: *Happy Childhood*. Appleton-Century. 1933.
 BENTLY: *Problem Children*. Norton. 1936.
 FAEGRE & ANDERSON: *Child Care and Training*. University of Minnesota Press. 1940.
 RICHARDS: *Behavior Aspects of Child Conduct*. Macmillan. 1932.
 THOM: *The Everyday Problems of the Everyday Child*. Appleton-Century. 1936.
Habit Training for Children. (Pamphlet.) National Committee for Mental Hygiene.
Understanding the Child. Magazine published by National Committee for Mental Hygiene, New York, N. Y.

Home Nursing

- American Red Cross First Aid Textbook*: American Red Cross. 1937.
 BROADHURST: *Home and Community Hygiene*. Lippincott. 1929.
 DELANO: *Home Hygiene and Care of the Sick*. American National Red Cross.
 DENNETT & WILKES: *Mother's Guide When Sickness Comes*. Doubleday Doran. 1934.
 SHEPARD & LAWRENCE: *Textbook of Attendant Nursing*. Macmillan. 1935.
 TURNER, MORGAN & COLLINS: *Home Nursing and Child Care*. Heath. 1939.
 WILLIAMS: *Hygiene and Sanitation*. Saunders. 1935.

MOTION PICTURE FILMS

The Massachusetts Department of Public Health, Division of Child Hygiene, 73 Tremont St., Boston, lends the following films, without charge, for use within the State.

They can be shown in any machine taking 16 m.m. films.

The Department does *not* lend a machine.

Please make reservations as far in advance as possible, giving a choice of dates on which films could be used.

The ABC of Food (1 reel). This shows the basic facts of nutrition and their relation to health. For use with adults or high school groups.

Food and Growth (1 reel). Shows the food value of milk as compared with tea or coffee by a feeding demonstration with white rats carried on in the classroom.

Forming Habits of Health (1 reel). This is of special value in teaching health habits to junior and senior high school girls. Especially good for girls' clubs. Does not appeal to boys.

A Healthy Child (1 reel). Illustrates all activities in a normal child's life, stressing periodical medical and dental examinations, correct posture, proper food, wholesome exercise, care of the teeth, etc. Valuable in work with junior and senior high schools. Especially suitable for use in home nursing and child care classes.

Ask Your Dentist (1 reel). An excellent film for children in the 4th grade through the senior high school and of interest to many adults.

Care of the Teeth (1 reel). Shows the parts of the tooth, prophylactic treatment, progress of decay, and rules for home care. For use in grades 5 and up.

How Teeth Grow (1 reel). Shows the growth, development, and arrangement of the teeth, the different kinds and parts, and their use. For use with grades 6 and up, and at meetings of Parent-Teacher associations and mothers' clubs.

Posture (1 reel). Illustrates the sitting and standing posture, emphasizing the value of good posture. Prepared for use with grades 5 and up.

Feet (1 reel). Shows the structure of the foot, its use, proper shoes, and common foot defects. Prepared for use with grades 5 and up.

Home Nursing (3 reels). One reel shows the bed bath, the other two the routine and special procedures for home care of the sick. For use with home nursing classes or with mothers' clubs.

Nursing (2 reels). This shows the work of the student nurse and the methods used in her professional training, as well as the fields open to her upon graduation.

Diphtheria (1 reel). Shows the nature of diphtheria and methods for its control. Intended for use with grades 6 and up. Can be used with adults.

Tuberculosis and How It May Be Avoided (1 reel). Shows tubercle bacilli growing in the laboratory and in the lung tissue of the human body. Daily routine at preventorium is pictured. For high school or adult use.

Films are available also from the Metropolitan Life Insurance Company, the Massachusetts Tuberculosis League, and other organizations interested in health.

The Commonwealth of Massachusetts

SUGGESTED TEACHING UNITS ON FIRST AID FOR GRADE 9 BOYS

MASSACHUSETTS COURSE OF STUDY IN HEALTH EDUCATION

Bulletin No. 5
1941



ISSUED JOINTLY BY
MASSACHUSETTS DEPARTMENT OF EDUCATION
AND
MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
BOSTON, MASSACHUSETTS

FOREWORD

A committee has been organized for some years for the purpose of establishing outlines in health. This committee was originally sponsored in the Massachusetts Department of Education in 1932 by Frank Purinton Morse, then Supervisor of Secondary Education.

A mimeographed report was issued for purposes of trial in certain interested school systems. About three years ago, it was definitely decided that the immediate task was to establish these outlines for the use of grades seven, eight, and nine, and to defer the preparation of outlines for the upper grades to a later date.

A second report was mimeographed and used for experimental purposes in certain schools in 1936-37.

The following bulletin is one of five which has been prepared by the committee. The Massachusetts Department of Education is pleased to cooperate with the Massachusetts Department of Public Health in the issuance of these bulletins. I wish to thank all concerned, and particularly the committee whose names are herein listed, who have made the work possible.

WALTER F. DOWNEY,
Commissioner of Education.

The Massachusetts Department of Public Health, realizing that the school health education program is an integral part of preventive medicine and the public health program, is especially pleased to cooperate with the Massachusetts Department of Education in the publication of a guide for the teaching of health in the junior high school. It is the duty of the public health profession to inform the educational profession as to the thoughts and actions which they wish the citizens of the community to have regarding their health. The cooperation of the public health profession with the teaching profession is indeed a powerful alliance and one which is going to make it possible to bring closer to realization our goal, a people free of preventable illness and defects.

PAUL J. JAKMAUH, M. D.
Commissioner of Public Health.

COMMITTEE ON HEALTH EDUCATION IN THE SECONDARY SCHOOLS

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Subcommittee for the Preparation of the Bulletin on First Aid

- Ann W. Dinegan, B. S., R. N., Supervising Instructor in Public Health Nursing, Massachusetts Department of Public Health.

INTRODUCTORY NOTE TO TEACHERS

The Committee on Health Education in the Secondary Schools was appointed by the Department of Education. This Committee set up the general plan. Individual members prepared teaching units on the respective topics. These units were revised upon the basis of suggestions from other members of the Committee. The revised units were mimeographed and placed in the hands of a limited number of junior high school teachers whose suggestions and criticisms were considered in making the later revision.

For the purpose of still more effectively adapting the material to the age levels for which it was prepared, subcommittees of junior high school teachers and administrators examined and further revised various units which were then turned over to a small editing committee.

The work of the committees represents a voluntary time contribution on the part of committee members who were already carrying a full schedule of professional work. This fact and the experimental use of the present units explains why the units themselves have not all been put into similar form. The teacher is referred to the separate bulletin on *Suggestions to School Administrators for Health Teaching in Junior High Schools* for a consideration of the general plan.

The units are planned to follow an adequate program of health instruction in the elementary schools. This program of study proposes the teaching of *Community Health* in Grade VII; *Physiology as Applied to Daily Living* in Grade VIII; also *Physiology as Applied to Daily Living* for the first half of the school year for Grade IX. It proposes the teaching of *Home Nursing and Child Care for Girls* and *First Aid for Boys* in the last half of the ninth year. Both teacher and pupil references are included in connection with the units to be taught.

This is a tentative outline, for a later revision of which, your suggestions are desired concerning grade placement, interest, other possible experiments, activities, demonstrations, references, and visual material.

The units are planned on the assumption that two periods a week throughout the school year are available for health instruction. If your time allotment does not allow you to complete all the units, it is recommended that you teach adequately the most important ones and omit the others.

This outline presupposes the program of instruction prescribed for the first six grades in the *Course of Study in Health Education for the Elementary Grades*, published in 1931 by the Massachusetts Department of Education. If your pupils have not had this training, you will need to take that fact into consideration.

TEACHING UNITS ON FIRST AID

General Objectives:

1. To call attention to ways of avoiding common ailments and accidents.
2. To interpret meaning of "First Aid" and emphasize importance of calling a physician for treatment.
3. To teach first aid or emergency care to be given in case of minor injuries at school, at home, at work, or at play.

Possible Approaches:

1. Discuss the various types of injuries and accidents encountered in the experience of the group, the circumstances under which each occurred, and the ways by which each might have been prevented.
2. Discuss and demonstrate the kind of care which each different type of injury should be given during the interval before the arrival of a physician.

It is understood that this course should be given by a registered nurse experienced in First Aid or by a teacher who has satisfactorily completed a course in First Aid.

A standard textbook for use in teaching first aid is the *American Red Cross First Aid Textbook* (revised edition of 1937).

List of Units:

- I. Dressings and Bandages
 - Wounds
 - Abrasions
 - Incised wounds
 - Lacerated or torn
 - Punctured wounds
 - Splinters
 - Shock*
- II. *Injuries to Bones, Joints, and Muscles*
 - Fractures
 - Simple
 - Compound
 - Dislocations
 - Sprains
 - Bruises
- III. *Injuries Due to Heat and Cold*
 - Burns and scalds
 - Shock
 - Chemical burns
 - Frostbite
 - Prolonged exposure to cold
 - Poisons*
- IV. *Common Emergencies*
 - Blisters
 - Boils
 - Colds
 - Convulsions
 - Hiccough
 - Hives
 - Fainting
 - Nosebleed
 - Foreign bodies in eye, ear, nose, and throat
 - Insect bites
 - Poison ivy
- V. *Drowning and Suffocation*
 - Artificial respiration

UNIT I

Wounds*Objectives:*

1. To give information on materials that may safely be used next to the wound.
2. To teach proper method of handling materials to be used on a wound.
3. To demonstrate methods of applying bandages.
4. To teach the different kinds of wounds and the proper kind of first-aid care for each kind.

*Suggested Activities:**Dressings:*

Discuss and demonstrate the different kinds of material which may be used for dressings or compresses and the kinds of wounds for which they should be used.

Gauze—absorbent cotton wrapped in gauze

Clean cotton cloth

Clean handkerchiefs

Clean towels

Discuss difference between material which is *clean* and that which is *sterile*.

Discuss simple methods of sterilizing dressings.

Demonstrate method of handling sterile materials. Arrange for practice and return demonstrations by pupils.

Bandages:

Demonstrate different kinds of bandages used in First Aid.

Triangular

Discuss

Material—unbleached muslin

Method of making—36 to 40 inches square, cut diagonally.

Demonstrate various uses:

Head

Hand or foot

Elbow or knee

Eye

Head or ear

Arm sling

Face or back of head

Arrange for return demonstrations by pupils after practice.

Roller or Pleated Gauze Bandage

Discuss chief uses

1. To make a compress.

2. Bandage of finger or toes hand or foot.

Discuss general principles of bandaging precautions to observe.

Demonstrate

use of roller gauze bandage as a compress observing aseptic technique

method of bandaging a

finger

toe

hand

foot

Arrange for return demonstrations by pupils after practice.

Four-tailed Bandage

Discuss method of making.

Demonstrate its use.

Arrange for return demonstrations by pupils after practice.

Wounds

Discuss four different types of wounds:

1. Abrasions
2. Incised wounds
3. Lacerated or torn
4. Punctured wounds

Classify different wounds experienced by group under these headings

Discuss two dangers connected with wounds

1. Infection
 - a. what it is
 - b. causes
 - c. prevention
2. Serious bleeding or hemorrhage
 - a. describe difference between arterial and venous bleeding.
 - b. demonstrate six points where main arteries lie close to a bone and where pressure may be applied to stop bleeding.
 - c. demonstrate use of tourniquet. What precautions must be taken in use of tourniquet?

Shock

Discuss causes

Symptoms

First-aid treatment

demonstrate methods of applying heat

discuss precautions to be taken in applying heat

ref. pp. 86-87 *American Red Cross First Aid*

Textbook

Reference Reading:

American Red Cross First Aid Textbook (revised edition, 1937)
 Chapters I-VII.

UNIT II

Injuries to Bones, Joints, and Muscles*Objectives:*

1. To discuss means of prevention of fractures.
2. To teach general first-aid treatment of fractures, simple and compound.
3. To teach general first-aid treatment of dislocations, sprains, and bruises.

*Suggested Activities:**Fractures*

Definition.

Discuss

1. differences between simple and compound fractures—symptoms of each kind.
2. causes.
3. means of prevention.

Discuss objectives of first-aid treatment of simple fractures before physician arrives.

Discuss and demonstrate method of improvising a splint made of padded boards or other rigid materials for use on forearm or lower leg.

Dislocations

Definition.

Discuss

1. causes.
2. symptoms.
3. general treatment.

Sprains

Give definition.

Distinguish from a dislocation.

Discuss

causes.
symptoms.
treatment.

caution that treatment should be for a fracture, if any doubt.

demonstrate application of sprained ankle bandage as illustrated on p. 56 of *American Red Cross First Aid Textbook*.

Strains

Give definition.

Discuss

causes.
symptoms.
treatment.

demonstrate methods of applying heat.

Bruises

Give definition.

Discuss

symptoms.
treatment.

demonstrate application of cold compresses.

Reference Reading:

American Red Cross First Aid Textbook—Chapter VIII.

UNIT III

Injuries Due to Heat and Cold

Objectives:

1. To teach the various ways of preventing burns and scalds.
2. To teach various means of rescue from fire.
3. To teach the different types of treatment according to the severity of the burns.
4. To teach prevention and treatment of frostbite.
5. To teach prevention and treatment of poison cases.

Suggested Activities:

Discuss the various causes of burns experienced by students, by friends, or by members of the community.

How might these burns have been prevented?

What means of rescue might have been used?

Demonstrate wrapping of body in blanket.

Discuss various ointments or dressings which can be used on burns of limited extent.

Demonstrate method of dressing a burn of limited extent—noting precautions to be taken.

Discuss kind of care to be given for burns caused by an acid, alkali or any other chemical.

Discuss causes and symptoms of frostbite.

What is treatment? Emphasize danger of getting near heat.

Discuss means of preventing poisons being taken.

Discuss treatment—dilution and washing out of poison.

What are the common emetics?

Reference Reading:

American Red Cross First Aid Textbook—Chapters IX and X.

UNIT IV

Common Emergencies

Objectives:

1. Orientation in the large field of common injuries and mishaps.
2. To acquaint students with the accepted first-aid procedures.

Suggested Activities:

Blood and Water Blisters

Discuss causes of blood or water blisters.

Demonstrate treatment—precautions to be taken in opening.

When should physician be consulted?

Boils

What is a boil? What may be the cause?

What is the treatment?

What harm is done by squeezing a boil?

Colds

What is the primary cause of a cold?

How is one's vitality lowered through allowing the growth of germs?

How may colds be avoided?

What is the treatment? When should the physician be consulted?

Convulsions

What are the symptoms of convulsions?

Discuss some of the causes.

What is the treatment?

Hiccoughs

What happens when one hiccoughs?

•What causes them?

How may they be stopped?

Hives

Discuss signs and symptoms of hives.

What causes them?

How are they treated?

Fainting

- Discuss causes of fainting.
- What is the simplest remedy?
- How may complete loss of consciousness sometimes be avoided?
- Demonstrate care of a person who has fainted.

Nosebleed

- What may be the cause?
- Why do some nosebleeds stop by themselves?
- What is the usual remedy?

Foreign Bodies in—

- Eye—common irritants?
 - what is nature's remedy?
 - what is usual treatment?
 - demonstrate manipulation of the eyelid and the use of a corner of a clean cloth.
 - what are means of prevention?
- Ear—common objects?
 - what can be done to stop buzzing of insect?
 - who should remove the object in every case?
- Nose—common objects?
 - who should remove the object?
- Throat—common objects?
 - what is treatment of a child who has swallowed a foreign body?

Insect Bites

- What are the symptoms?
- Discuss usual treatment.
- Discuss danger of disease-bearing insects.

Poison Ivy

- Discuss cause of poisoning—symptoms and preventions.
- Discuss treatment.

Reference Reading:

American Red Cross First Aid Textbook—Chapter XII.

UNIT V

Drowning and Suffocation*Objectives:*

1. To teach prevention.
2. To teach artificial respiration according to the standard technique.

Suggested Activities:

- What rules, if observed, will prevent a person from drowning?
- If a person has been submerged, what steps should be taken to remove the water from the lungs?
- Demonstrate the standard technique of applying prone pressure.
- Plan for adequate practice periods under supervision.

Reference Reading:

American Red Cross First Aid Textbook—Chapter VII.

First-Aid Kit

A good first-aid kit contains such articles as the following:

- 1-inch compress on adhesive in individual packages
- Sterile gauze squares—about 3" x 3"—in individual packages
- Assorted sterile bandage compresses in individual packages
- Triangular bandages
- Sterile gauze in individual packages of about 1 sq. yd.
- Picric acid gauze
- Burn ointment—such as 5% tannic acid jelly
- Iodine, mild
- Aromatic spirit of ammonia
- Inelastic tourniquet
- Scissors
- 3-inch splinter forceps
- Paper cups
- 1-inch and 2-inch roller bandages
- Wire or thin board splints
- Castor oil or mineral oil, for use in eyes. This should be sterile; may be obtained in small tubes.

Pocket Emergency Kit

The following may be kept in a small metal box or can:

- Absorbent cotton
- 1-inch and 2-inch compresses on adhesive
- Safety pins
- Small bottle of Mercurochrome, or iodine ampoules
- Small bottle of spirit of ammonia
- Needles
- Package of matches

Bibliography

Recommended Reading

- American Red Cross First Aid Textbook*. Revised edition, 1937. American Red Cross, Washington, D. C.
- Life Saving and Water Safety*. 1937. American Red Cross, Washington, D. C.
- First Aid*. Boy Scouts of America, New York, N. Y.
- Scouting for Girls*. Chapter XI. Girl Scouts, Inc., New York, N. Y.
- Safety for the Household*. Government Printing Office, Washington, D. C.
- TURNER: *Home Nursing and Child Care*. Chapters XII, XV, and XVI. Heath. 1930.

Teachers' References

- American Red Cross First Aid Textbook*. 1937. American Red Cross, Washington, D. C.
- Life Saving and Water Safety*. American Red Cross, Washington, D. C.
- Massachusetts Course of Study in Health Education*. Massachusetts Department of Education, Boston, Mass.
- COLE & ERNEST: *First Aid for Boys*. Revised edition, 1931. Appleton-Century.
- First Aid Guide*. Johnson & Johnson, New Brunswick, N. J.
- WINSLOW: *Healthy Living*, Book 2. Merrill. 1920.
- WINSLOW & WILLIAMSON: *The Laws of Health and How to Teach Them*. Merrill. 1925.
- Johnson & Johnson Chart for First Aid Instruction*. Mahady, Boston, Mass.
- First Aid*. Metropolitan Life Insurance Company, New York, N. Y.
- Good References—Safety Education*, Bibliography No. 65, U. S. Office of Education, Washington, D. C.





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